ENGINEERING REPORT

for

CONTRACT NO. DACW 33-83-D-0006
WORK ORDER NO. 0027

SUBSURFACE INVESTIGATION

PIEZOMETER INSTALLATION OF HODGES VILLAGE DAM

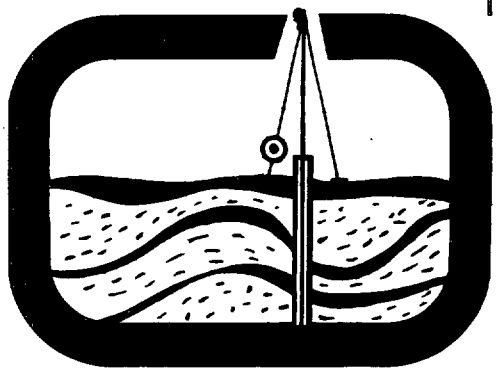
Located in

OXFORD, MASSACHUSETTS

Prepared for:

U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254

Project No. 60070
August 12, 1985



EGA

EGA
EASTERN GEOTECHNICAL ASSOCIATES • BRIGGS
164 Washington Street, Norwell, MA 02061 ▶ Telephone (617) 773-1744

August 12, 1985
Project No. 60070

U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254

Attention: Jim Blair - 117 South

RE: Contract No. DACW 33-83-D-0006
Work Order No. 0027
Piezometer Installation
at Hodges Village Dam
Oxford, Massachusetts

Dear Mr. Blair:

In accordance with Work Order No. 0027, dated April 10, 1985, attached are two final copies of our Engineering Report for the Piezometer Installation Program performed at Hodges Village Dam in Oxford, Massachusetts.

If you have any questions, or comments, please do not hesitate to call.

Very truly yours,

Mark A. Owens by CHG

Mark A. Owens
Geologist

Charles H. Gross

Charles H. Gross, P.E.
Assistant Vice President
Manager, Geotechnical Division

MAO:CHG:cc

Attachments

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1.0 GENERAL

1.1 Authorization

The work performed and recorded herein was derived under Contract DACW 33-83-D-0006, Work Order No. 0027, dated April 16, 1985. The authority for this project was located under Piezometer Installation of Hodges Village Dam.

1.2 Project Site

The project site is located approximately 3.0 miles west of Interstate Route 395 in Oxford, Massachusetts in the French River Basin.

1.3 Purpose of the Investigation

The purpose of the Work Order is to install Casagrande type piezometers. These piezometers will be used to determine the phreatic condition, pore pressures, and permeability of the existing earthen dam structure.

1.4 Scope of the Investigation

Inspection, exploration, and installation instructions provided by the Army Corps of Engineers, New England Division, are included as Appendix A to this report.

This scope of work included six (6) drive sample borings (SPT) and installation of ten (10) Casagrande open end type piezometers. Five of the six test boring locations were previously surveyed in by Eastern Geotechnical Associates. The remaining boring location was determined by means of taping in the field.

The drive sample borings were performed in accordance with Paragraph '6A' under Part II, "Specifications for Services and Equipment Necessary for Conducting Geotechnical Exploratory Work at Various Locations in New England", Proposal No. DACW 33-83-R-0005, dated February 18, 1983.

A two foot split barrel sampler was driven two feet at a time in intervals of five feet. Borings were taken to previously specified sampling depths or to refusal. When refusal was encountered above the specified overburden sampling depth, a maximum of five feet of rock core was drilled. The field logs of the test borings are included in Appendix D of this report. Piezometer installation and subsequent falling head permeability tests were performed in accordance with Paragraph '14', Subparagraph C (1) of the aforementioned specifications. The results of the falling head permeability testing are included in the boring logs in Appendix D.

2.0 QUALITY CONTROL

2.1 Equipment

The following equipment and tools were used to perform the work:

a. Core Drill: The core drill used was a truck mounted hydraulically driven rotary head unit supplied by Mobile District.

b. Drive Hammer: The drive hammer used to advance the two foot split spoon sampler and casing was of the safety type and weighed 140 pounds.

c. Casing and Rods: 6.0 inch casing was used to begin and seal off each hole. 4.0 inch casing was left in place in two borings as piezometer protection pipe. NW size rods were used to drill and to advance the split spoon sampler.

d. Drill Bits: Both 6.0 inch and 4.0 inch roller rock bits were used to advance bore holes and clean out casing. A 4.0 inch inside diameter diamond core bit was used to core bedrock and various boulders.

e. Piezometers: Ten Casagrande type piezometers, consisting of fine grade tips with 3/4 inch diameter schedule 80 PVC riser piping.

2.2 Records

Records were kept of all activities and field procedures. Test boring logs contain the following information:

1. Name of the project
2. Site location designation
3. Ground elevation (borings) at location of exploration
4. Date exploration performed
5. Method of penetration
6. Depth of penetration
7. Density of materials encountered
8. Names of drillers and inspector
9. Blows per six inches of penetration
10. Hole number and designation
11. Type of drilling and sampling operation by depth
12. Dates and time when drilling and sampling operations were performed
13. Depths at which samples or cores were recovered or attempts made to sample including top and bottom depths of each sampling interval. Classification or description including geologic and common usage, designation such as till, fluvial deposits, etc., by depths of materials sampled or penetrated including a description of moisture conditions, color and conditions of compactness or stiffness of soils materials encountered. Record of penetration resistance such as drive hammer blows given in blows per six inches of penetration depth for driving sample spoons.
14. Depth to bottom of hole
15. Percentage of sample of core recovered per run

16. Groundwater information

17. Geotechnical instrumentaion installation

18. Other pertinent information

2.3 Procedures

a. Borings FD-85-1(A) through FD-85-5(D) were previously surveyed in by Eastern Geotechnical Associates and offset in the field by taping from these locations when necessary. Boring FD-6(F) was located by scaling off the provided site plan (refer to Figure 1), and subsequent taping in the field. Elevations were obtained from the site plan.

b. Bore holes were advanced by sampling with a 1-7/8 inch by 2.0 foot spoon sampler. The sampler was advanced two feet at a time in five foot intervals to the required depth or until refusal with a 140 lb hammer falling 30 inches. Refusal was defined as 100 blows with no penetration or bouncing refusal. The sample spoon shoes were kept reasonably sharp at all times. Dull, bent or otherwise damaged samplers were not used. Following sampling, the bore hole was advanced and cleaned out using an appropriately sized roller rock bit. Six and four inch flush joint casing was used to seal off bore holes before sampling procedures were initiated.

c. Upon encountering refusal the bore hole was advanced by coring operations. Coring was accomplished with a five foot HW size core barrel. When breakthrough occured prior to the specified depth the bore hole was enlarged with a larger sized roller rock bit and overburden sampling operations were reinstated.

d. Samples were classified in the field immediately following the taking of the sample. Classification was in accordance with ASTM D-2487 and D-2488. Representative samples were taken from each soil sampling run and placed in 16 oz. glass jars with hermetically sealed lids. Jars were labeled with sample number, and soil description. All field classifications were verified in our laboratory. Chain of custody logs were maintained documenting custody between the field and transportation and delivery to the lab at NED. The chain of custody logs are included in Appendix C of this report.

3.0 QUALITY CONTROL CERTIFICATION

I hereby certify that the aforementioned records, equipment, and procedures were used to perform the subsurface exploration described herein. I also certify that the work was performed in a professional manner and meets the requirements set forth in the delivery order.

Certified August 12, 1985

David S. Campbell, P.E.
President

ATTACHMENTS

Table 1

Figure 1

Appendix A

Appendix B

Appendix C

Appendix D

HODGES VILLAGE W.O. #27

OXFORD, MASSACHUSETTS

ACTIVITY SUMMARY SHEET

DATE	ACTIVITY
May 16	Thursday: Mobilized drill rig and crew and personnel. Set up on Boring FD-85-1(A) and began drilling operations. Total drill footage 10.0'. Standby time of 4.0 hours, used to set-up.
May 17	Friday: continued drill operations on Boring FD-85-1(A). Total drill footage 16.0'. No standby time.
May 20	Monday: completed Boring FD-85-1(A). Began set-up on Boring FD-85-2(B). Installed Peizometers #1 and #2. Total drill footage 10.0'. Standy time of 3.0 hours, used to install Piezometers #1 and #2 and begin set-up on FD-85-2(B).
May 21	Tuesday: Began Boring FD-85-2(B). Total drill footage 35.0'. Standby time of 1.0 hour, used to complete set-up on Boring FD-85-2(B).

May 22 — Wednesday: Completed Boring FD-85-2(B) set-up and started Boring FD-85-3(E). Installed Piezometers #3 and #4. Total drill footage 14.0'. Standby time of 3.0 hours, used to install Piezomters #3 and #4, and set-up on Boring FD-85-3(E).

May 23 — Thursday: Completed Boring FD-85-3(E). Installed Piezomter #9. Total drill footage 21.0'. Standby time of 1.0 hour, used to install Piezometer #9.

May 24 — Friday: Standby time of 8.0 hours, used to repair hydraulic system on rig.

May 27 — Monday:Holiday

May 28 — Tuesday: Standby time of 8.0 hours, used to complete repairs on hydraulic system and set-up on FD-85-4(C).

May 29 — Wednesday: Began Boring FD-85-4(C). Total drill footage 40.0'. No standby time.

May 30 — Thursday: Completed Boring FD-85-4(C). Installed Piezometers #5 and #6. Total drill footage 32.0'. Standby time 2.0 hours, used to install Piezometers #5 and #6.

May 31 — Friday: Set-up and began Boring FD-85-5(D). Total drill footage 10.0'. Standby time of 4.0 hours, used to set-up and unload the supply truck from Mobile District.

June 3 — Monday: Continued drilling operations on Boring FD-85-5(D). Total drill footage 55.0'. No standby time.

June 4 — Tuesday: Completed Boring FD-85-5(D). Installed Piezometers #7 and #8. Grouted 5.0'protection pipes around Piezometers #1 through #8. Total drill footage 8.5'. Standby time of 6.0 hours, used to install piezometers, grout in protection pipes, and test piezometers.

June 5 Wednesday: Set-up and began Boring FD-85-6(F). Total drill footage 10.0'. Standby time of 6.0 hours, due to rain and set-up.

June 6 Thursday: Water pump malfunctioned. Attempted repairs and tried to locate alternate pump. Standby time of 8.0 hours.

June 7 Friday: Waterpump could not be repaired. Alternate pump received 4:00 p.m. Standby time of 8.0 hours.

June 10 Monday: continued Boring FD-85-6(F). Total drill footage 20.0'. No standby time.

June 11 Tuesday: Completed Boring FD-85-6(F). Installed Piezometer #10. Total drill footage 6.0'. Standby time of 4.0 hours, used to install and test Piezometer #10 and assemble equipment for demobilization.


CORPS OF ENGINEERS
U. S. ARMY
A
B
E
F
G
H
1
2
3
4
5
6
7
8
FD-85-1(A)
PZ 1+2
PZ 3+4
FD-85-2(B)
PZ-1
PZ-2
FD-85-4(C)
PZ 5+6
PZ 7+8
FD-85-5(D)
FD-85-3(E)
PZ 9
PZ 10
FD-85-6(F)
DAM
Exist Electric Line
Toe of Dam
EL 510±
ACCESS ROAD A
UTILITY BUILDING
PARKING AREA
OPERATOR'S QUARTERS
Drainage Line A (Subdrain)
Drainage Line B (Subdrain)
Drainage Line C
Drainage Line D
Approx Location of Exist 6" Water Supply Line
Existing Road (broken Surface)
Existing Riprap
Toe of Slope
Pond
Spillway
FRENCH RIVER
Howarth Road
(Blacktop)
WORCESTER
PROJECT LOCATION
WEBSTER
MASS
CONN
R I
PUTNAM
BOSTON
PROVIDENCE
LOCATION MAP
SCALE IN MILES
PLAN
SAFETY PAYS
GRAPHIC SCALES
PIEZOMETER LOCATION PLAN
FIG 1
APPROVED
DRAWING NUMBER
SHEET 1
FIELD COPY
ATTACHMENT 3

PIEZOMETER	TOP OF STAKE EL	BORING ELEVATION
PZ 1+2	484.92	488.0' ±
PZ 3+4	483.94	488.0' ±
PZ 5+6	518.29	518.0' ±
PZ 7+8	518.40	519.0' ±
PZ 9	484.47	483.0' ±
PZ 10	–	484.0' ±

APPENDIX A

Inspection & Exploration Instructions

ATTACHMENT NO. 1
GEB REQUISITION NO. 85-37
DELIVERY ORDER NO. 27
INSPECTION, EXPLORATION PIEZOMETER INSTALLATION AND SURVEY INSTRUCTIONS

PROJECT: Piezometer Installation

SITE: Hodges Village Dam, Oxford, MA

PURPOSE: Installation of piezometers to determine the phreatic surface within the embankment and foundation for all pool elevations determine pore pressures and average permeabilities of the embankment and foundation soils.

1. SCOPE OF INVESTIGATION

a. Investigations include five (5) standard penetration test borings and installation of one (1) single piezometer and four (4) double piezometers to be performed by the Government.

b. Piezometer locations have been staked in the field by Eastern Geotechnical Associates. Locations and top elevations are shown in attachments 2 & 3.

c. (1) Standard penetration test borings shall be performed by Mobile District. Sampling shall be to refusal or to final overburden sampling depth as specified in Attachment No. 2.

(2) Refusal is defined as 100 blows with no penetration or bouncing refusal.

d. (1) When refusal is encountered prior to reaching the specified overburden sampling depth, the boring shall be advanced by core barrel drilling. When rock is encountered, 5 feet of rock shall be cored. If a break-through occurs before reaching the specified overburden sampling depth, continuous sampling shall be resumed.

(2) Casing size shall be no smaller than HX size (4" ID) at the bottom elevation of the boring. One solid ten foot piece of casing will be left in place for all boring except for FD-E where casing shall be left thru the rockfill zone. Stick up shall be between 3.0 feet ± 0.5 feet. A threaded cap shall be installed on top of casing.

e. Casagrande open-type piezometers (provided by Government) shall be installed and shall consist of fine-grade porous stone piezometer tip or similar, 3/4-in. Schedule of 80 PVC pipe and fittings and fill materials consisting of graded filter sand, bentonite pellete impervious (clay-type) soil and cement-bentonite grout mix. Different color PCV pipe shall be used to distinguish double piezometers. Installations shall conform to cross sections provided in Attachment No. 5. Piezometer tip elevations are shown in Attachment No. 2.

f. Immediately after completion of installation, each piezometer shall be subjected to a falling-head permeability test which shall be

conducted by the inspector. The inspector shall supply all the equipment (ie, water level indicator) necessary to run test and keep accurate logs of the test performed according to items 14. c (1), (2) & (3) of contract specifications.

g. A geotechnical inspector (provided by EGA) shall act as field inspector while performing the borings and installing piezometers. The inspector shall provide telephone reports to Mr. Wong, Corps of Engineers, at 617-647-8177 every working day and upon encountering refusal or completion of each boring prior to piezometer installation.

h. The installed piezometer standpipes shall be located by EGA surveyors. Top elevation of piezometer standpipe cap shall be determined by level and locations determined by EDM survey.

i. All samples shall be delivered by EGA to the Corps of Engineers Headquarters in Waltham, MA by the field inspector. Sample delivery shall be coordinated with the Director, NED Materials and Water Quality Laboratory at 617-647-8367/8392.

2. SITE CONDITIONS.

The site is Hodges Village Dam, a Corps of Engineers dam in Oxford, MA. The drilling operations will be performed along the crest of the dam and towards the bottom of the up stream and downstream slopes (see attachment 3. Anticipated subsurface materials are shown in Attachment Nos.3 & 4.

3. RIGHTS OF ENTRY.

The geotechnical inspector shall secure rights of entry by contacting the Project Manager at the dam at 617-987-2600.

4. COORDINATION.

Mr. Terrance Wong, Corps of Engineers, 617-647-8177, shall be contacted five days prior to start of work and at least every two work days or on completion of each boring whichever is more frequent. The geotechnical inspector shall report on how work is progressing and what types of material are being encountered.

5. EXPLORATION.

The drive sampling borings designated FD-A thru FD-E located on Attachment 3 shall be numbered FD-84-1 through FD-84-5 in order of their completion. The new numbers shall be indicated on the exploration logs and shown on a plan of explorations.

6. COMPLETION SCHEDULE.

Services under this delivery order shall start on or about 22 April 1985. (Actual date to be confirmed by Mobile District.) Duration of field work is estimated to be 13 work days. The geotechnical inspectors report shall be submitted by the geotechnical inspector in draft format for review, by Geotechnical Engineering Branch, no later than seven calendar days after completion of the field work. Review will take

approximately ten calendar days from receipt of draft report. The final geotechnical report shall be submitted no later than seven calendar days after receipt of draft report including the action taken on possible comments.

7. QUALITY CONTROL.

You will be held responsible for the quality of the maps submitted and for all damages caused the Government as a result of your negligence in the performance of any services furnished under the contract.

Although submissions required by your contract are technically reviewed by the Government, it is emphasized that your work must be prosecuted using proper internal controls and review procedures. The letter of transmittal for each submission which you make shall include a certification that the submission has been subjected to your own review and coordination procedures to insure (a) completeness for each discipline commensurate with the level effort required for that submission, (b) elimination of conflicts, errors and omissions, and (c) the overall professional and technical accuracy of the submission. Documents which are significant deficient in any of these areas will be returned to you for correction and/or upgrading prior to our completing our review. Contract submission dates will not be extended if a resubmission of draft material is required for this reason.

APPENDIX B

Safety Reports

EASTERN GEOTECHNICAL ASSOCIATES

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer

Date held May 20, 1985

THRU: Project Engineer

Time 0900 Hours

Weekly safety meeting was held this date for the following personnel:
Contract No. DACW 33-83-D-0006, W. O. No. 27

Personnel present:
Mark A. Owens
Raymond Brown
Glenn Holmes
James Williams

Conducted By: Mark A. Owens

1. Subjects discussed (Note, delete, or add):

Individual Protective Equipment - Ear protection, hard hats
Prevention of Falls -
Safe Lifting Techniques -
Emergency Communications -
xFire Prevention - Safe Burning Techniques
Sanitation, First Aid -
Tripping Hazards - trash, hose, nails in lumber -
Staging, Ladders, Concrete Forms -
xHand Tools -
Portable Power Tools -
Woodworking Machinery -
Equipment Maintenance (Zero defects) -
xHoisting Equipment -
xRopes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring -
Lockouts for safe clearance procedures -
Electrical, pressure, moving parts -
Welding -
Excavations -
xLoose Rock and Steep Slopes -
Explosives -
Water Safety -
Other -

Prepared by: Mark A. Owens
Field Engineer

2. Exposure:

3 days, 4-6 men, total exposure hours 116.

Signature: Nicholas A. Lamm
Project Engineer

3. Forwarded: NED, Waltham, MA

EASTERN GEOTECHNICAL ASSOCIATES

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer — Date held May 28, 1985

THRU: Project Engineer — Time 0730 Hours

Weekly safety meeting was held this date for the following personnel:
Contract No. DACW 33-83-D-0006, W. O. No. 27

Personnel present:
Mark A. Owens
Raymond Brown
James Williams
Glenn Holmes

Conducted By: Mark A. Owens

1. Subjects discussed (Note, delete, or add):

Individual Protective Equipment - Ear protection, hard hats
Prevention of Falls -
Safe Lifting Techniques -
Emergency Communications -
Fire Prevention -
Sanitation, First Aid -
Tripping Hazards - trash, hose, nails in lumber -
Staging, Ladders, Concrete Forms -
Hand Tools -
Portable Power Tools -
xWoodworking Machinery - Repairs & General Maintenance
Equipment Maintenance (Zero defects) -
Hoisting Equipment -
Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring -
Lockouts for safe clearance procedures -
Electrical, pressure, moving parts -
Welding -
Excavations -
Loose Rock and Steep Slopes -
Explosives -
Water Safety -
Other -

Prepared by: Mark A. Owens
Field Engineer

2. Exposure:

5 days, 3-5 men, total exposure hours 156. Total job exposure hours: 272.

Signature: Mark A. Owens
Project Engineer

3. Forwarded: NED, Waltham, MA

EASTERN GEOTECHNICAL ASSOCIATES

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer — Date held June 4, 1985

THRU: Project Engineer — Time 0730 Hours

Weekly safety meeting was held this date for the following personnel:
Contract No. DACW 33-83-D-0006, W. O. No. 27

Personnel present:
Mark A. Owens
Raymond Brown
James Williams

Conducted By: Mark A. Owens

1. Subjects discussed (Note, delete, or add):

xIndividual Protective Equipment - Ear protection, hard hats
xPrevention of Falls - Travel over Embankments
xSafe Lifting Techniques -
Emergency Communications -
Fire Prevention -
Sanitation, First Aid -
Tripping Hazards - trash, hose, nails in lumber -
Staging, Ladders, Concrete Forms -
Hand Tools -
Portable Power Tools -
Woodworking Machinery -
Equipment Maintenance (Zero defects) -
Hoisting Equipment -
Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring -
Lockouts for safe clearance procedures -
Electrical, pressure, moving parts -
Welding -
Excavations -
Loose Rock and Steep Slopes -
Explosives -
Water Safety -
Other -

Prepared by: Mark A. Owens
Field Engineer

2. Exposure:

5 days, 3-5 men, total exposure hours 138. Total job exposure hours to date: 410.

Signature: Nicholas A. Lamey
Project Engineer

3. Forwarded: NED, Waltham, MA

EASTERN GEOTECHNICAL ASSOCIATES

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer — Date held June 11, 1985

THRU: Project Engineer — Time 1200 Hours

Weekly safety meeting was held this date for the following personnel:
Contract No. DACW 33-83-D-0006, W. O. No. 27

Personnel present:
Mark A. Owens
Raymond Brown
James Williams
Glenn Holmes

Conducted By: Mark A. Owens

1. Subjects discussed (Note, delete, or add):

Individual Protective Equipment - Ear protection, hard hats
Prevention of Falls -
Safe Lifting Techniques -
Emergency Communications -
Fire Prevention -
Sanitation, First Aid -
Tripping Hazards - trash, hose, nails in lumber -
Staging, Ladders, Concrete Forms -
Hand Tools -
Portable Power Tools -
Woodworking Machinery -
xEquipment Maintenance (Zero defects) - Pump Repair
Hoisting Equipment -
Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring -
Lockouts for safe clearance procedures -
Electrical, pressure, moving parts -
Welding -
Excavations -
Loose Rock and Steep Slopes -
Explosives -
Water Safety -
Other -

Prepared by: Mark A. Owens
Field Engineer

2. Exposure:

5 days, 3-4 men, total exposure hours 152. Total work order exposure hours: 562

Signature: Nathan O. Lowney
Project Engineer

3. Forwarded: NED, Waltham, MA

APPENDIX C

Chain of Custody Logs

EASTERN GEOTECHNICAL ASSOCIATES

CHAIN OF CUSTODY LOG

Project: HODGES VILLAGE DAM OXFORD, MN

Contract DACW-33-83-D-0006, W.O. # 27

Items: Jar Samples 5 BOXES → 6 TOTAL BORINGS (58 SAMPLES)

Bottles _____

Core Boxes _____

Sampling Logs _____

	Date & Time Received	Date & Time Transfered	Comments	Condition
1.	_____	7/5/85 2:30 PM		good
2.	7.5.85 2:30 PM	Michael Morse	None	
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____

APPENDIX D

Field Logs of Test Borings

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. 0027

Site HODGES VILLAGE OXFORD, MA — Page 1 of 10 Pages

Hole No. FD-85-101 Diam. (Casing) 6", 4" — Boring Started 5/16/85

Co-ordinates: N _____ E _____ — Boring Completed 5/20/85

Drilled by MOBEL DRILL — Report Submitted _____

Purpose of Exploration PIEZOMETER INSTILLATIONS TO DETERMINE THE PHREATIC SURFACE, PORE PRESSURES, AND PERMEABILITIES

Elevation Top of Hole 484.0' M.S.L. — Casing Left in Place — Feet

Total Overburden Drilled 32.0' Feet

Elevation Top of Rock 452.0' M.S.L.

Elevation Bottom of Hole 448.0' M.S.L.

Total Rock Drilled 4.0' Feet

Total Depth of Hole 36.0' Feet

Core Recovered 50 %

Core Recovered 2.0' Ft.: 4" Diam. 24" In.

Soil Samples 1 7/8" In. Diam. 5 No.

Soil Samples _____ In. Diam. _____ No. — Water Table Depth 14.5'

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0'	3.0'	REMOVAL OF ROCK RIP Rap BY MANUAL METHODS
0.0'	5.0'	DRILLED 6" CASING
0.0'	30.0'	6" ROLLER ROCK AND WASHED OUT
5.0'	31.0'	SAMPLED WITH 1 7/8" x 3.0' split SPOON.
31.0'	36.0'	CORED BEDROCK WITH 4" HW CORE BARREL

Index

Ground Water _____ Back of Page 7
Boring Location Sketch _____ Back of Page 7
Overburden Record _____ Page 1-6
Rock Drilling _____ Page 8
PIEZOMETER INSTALLATIONS Page 9,10
_____ Page _____
_____ Page _____

Prepared by Mark A. Ohrens — Field Data — Lab Data

Submitted by Mark A. Ohrens

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site HODGES VILLAGE Page 2 of 10 Pages

Boring No. ED-55-1 Desig. PZ-1(A) Diam. (Casing) 6", 4"

Co-ordinates. N _____ E _____

Elevation Top of Boring 484.0' M.S.L.
Total Overburden Drilled 32.0' Feet
Elevation Top of Rock 452.0' M.S.L.
Total Rock Drilled 4.0' Feet
Elevation Bottom of Boring 448.0' M.S.L.
Total Depth of Boring 36.0' Feet
Core Recovered 50 % No. Boxes —
Core Recovered 2.0' Ft: 4" Diam. ___ In.
Soil Samples 1 7/8" In. Diam. 5 No.
Soil Samples _____ In. Diam. ___ No.

Hammer Wt. 140 lb Boring Started 5/16/55
Hammer Drop 30" Boring Completed 5/20/55
Casing Left —
Subsurface Water Data _____ Page 7
Obs. Well —
Drilled By MOBILE DISTRICT
Mfg. Dos. Drill _____
Inspected By: Mark A. Ohrens (EGA)
Classification By: Mark A. Ohrens
Classification By: _____

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1					REP RAP REMOVAL BY HAND FROM 0.0' - 3.0'	ROCK REP RAP
					DRILLED 6.0" DIAMETER CASING FROM 0.0' - 5.0' WITH 100 LBS OF DOWN PRESSURE AND WASHED OUT	ANGULAR MICA SCHIST COBBLES AND BOULDERS SIZE DECREASING WITH DEPTH.
					6" DIAMETER ROLLER BIT FROM 3.0' - 5.0'	
2						
3						GRAVELLY SILTY SAND
						COARSE TO FINE, MOSTLY FINE.
						20 - 30% NON PLASTIC FINES
						15 - 25% SUB ANGULAR GRAVEL
						SOME SCHISTIC ROCK FRAGMENTS.
4						BROWN - GRAY DRY (Sm)
						[FILL MATERIAL]
5			5.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 5.0' TO 7.0' WITH 140 LB HAMMER.	

GENERAL REMARKS: 10" DIAMETER ROLLER BIT ALSO USED FROM 0.0' - 3.0'

Site: RODGES VILLAGE OXFORD, MA.

Boring No. FD-85-1 (17)

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATER ALS
				57	ROLLER ROCKED AHEAD FROM 5.0' - 10.0' WITH 6" ROLLER ROCK BIT AND WASHED OUT.	
				90		
6	1	1 7/8"	TO	212		
				122		
				55		
7			7.0'	16"/4"		
8						
9						
10			10.0'		SAMPLED WITH 1 7/8" X 1.0' SPLIT SPOON FROM 10.0' TO 11.0' WITH 140 LB HAMMER. REFUSAL ENCOUNTERED AT 11.0'.	GRAVELLY SILTY SAND SAME AS SAMPLE #1 LESS ABUNDANT ROCK FRAGS. (SM) [FILL MATERIAL]
	2	1 7/8"	TO	19		
				100+ REF	ROLLER ROCKED AHEAD FROM 10.0' TO 15.0' WITH 6" ROLLER ROCK BIT AND WASHED OUT.	
11			11.0'	11"/4"		
12						
13						

Site: HODGES VILLAGE, OXFORD, MA. | Boring No. FD-85-1 (A) | Page 4 of 10

DEPTH (ft)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
14						
15			15.0'	46	SAMPLED WITH 1 7/8" x 3.0' SPLIT SPOON FROM 15.0' TO 17.0' WITH 140LB HAMMER	GRAVELLY SILTY SAND SAME AS SAMPLE #1 ABUNDANT ROCK FRAGS (SM)
16	3	17/8"	216	120	ROLLER ROCKED AHEAD FROM 15.0' - 20.0' WITH 6" ROLLER ROCK BIT AND WASHED OUT.	
				96		
				12		
17			17.0'	12" Rec	ORGANIC SILT FOUND IN WASH BETWEEN 17.0' - 18.0' POSSIBLE VIRGIN GROUND INTERFACE.	17.0' ORGANIC SILT FINE GRAINED DARK BROWN, MODERATELY PLASTIC. (OL)
18						18.0'
19						
20			20.0'	69	SAMPLED WITH 1 7/8" x 3.0' SPLIT SPOON FROM 20.0' TO 23.0' WITH 140LB HAMMER.	GRAVELLY SAND COARSE TO FINE, MOSTLY MEDIUM TO FINE, 15-25% SUB ROUNDED GRAVEL. 25% NON PLASTIC FINES. GRAY, MOIST. (SP)
				64	ROLLER ROCKED AHEAD FROM 20.0' TO 21.0' WITH 6" ROLLER ROCK BIT AND WASHED OUT.	
21	4	17/8"	99			21.0
				35	CORED COBBLES AND BOULDERS FROM 21.0 - 26.0' WITH 4" ID CORE BARREL	CORED QUARTZ COBBLES AND BOULDERS
				37	DOWN PRESSURE INCREASED FROM 150 - 450 LBS.	
22			23.0'			

13" Rec.

(Test) Boring No. FD-85-1(A)

Site: HODGES VILLAGE OXFORD, MA.	Boring No. FD-55-1 (A)	Page 5 of 10

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
							COBBLES + BOULDERS
	23						
	24						
	25						
	26					ROLLER ROCKED AHEAD FROM 26.0' TO 30.0' WITH 6" ROLLER ROCK BIT AND WASHED OUT.	
	27						27.0'
	28						
	29						
	30			30.0'	53	SAMPLED WITH 1 3/8" x 2.0' SPLIT SPOON FROM 30.0' TO 32.0' WITH 140-LB HAMMER.	SILTY GRAVELLY SAND COARSE TO FINE, 30-40% ANGULAR GRAVEL. 10-20% NON PLASTIC FINES. ABUNDANT WEATHERED MICA SCHIST FRAGMENTS. BROWN-GRAY. DAMP. (SP-SM)

Site: HODGES VILLAGE
OXFORD, MA.

Boring No. FD-55-1(A)

Page 6 of 10

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
30			30.0'			
	5	17/8"	TO	53 / 41	9H	
31	R.W.L.	4"ED	31.0'	7" Rec.	CORED FROM 31.0' TO 36.0' WITH 4.0" CORE BARREL	31.0' CORED QUARTZ BOULDER
						31.0' CORED BEDROCK
32						FINELY CRYSTALLINE QUARTZ MICA SCHIST VERY SOFT, FRACTURED, WEATHERED,
33						
			TO			
34						
35						
			36.0'			36.0'
36				3.0' Rec.	COMPLETION OF OVERBURDEN SAMPLING AND CORING OPERATIONS 36.0'	BOTTOM OF BORING 36.0'

(Test)

Boring No. FD-55-1(A)

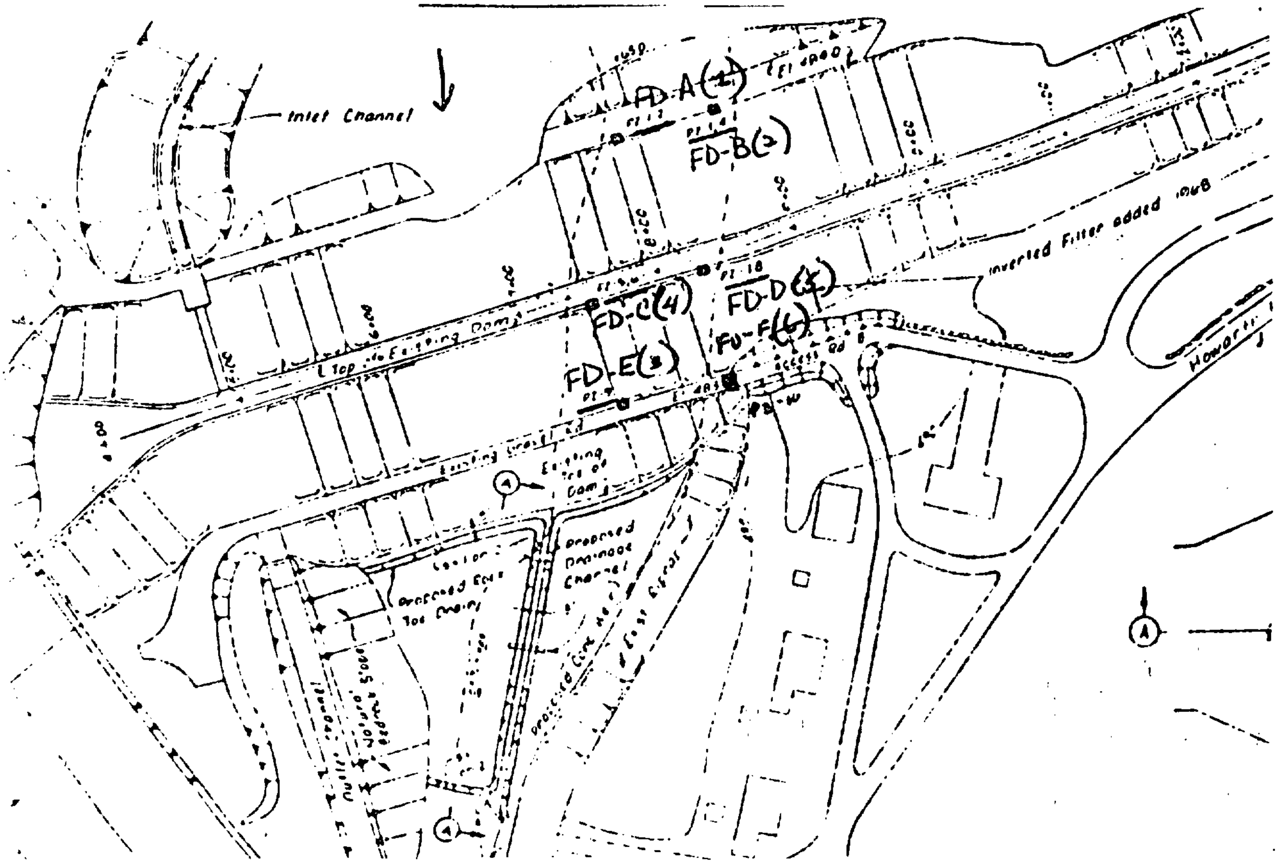
Site: HODGES VILLAGE
Boring No: FD-85-1 (A)

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
5/30/85	1:00pm	5.0'	36.0'	14.5'	469.5 ±	
6/5/85	10:45Am	—	36.0'	16.4'	467.6 ±	

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



FIELD LOG OF TEST BORING IN ROCK

SITE HODGES VILLAGE OXFORD, MA. HOLE NO. ED-65-1(A) PAGE 8 of 10

DATE	DEPTH PT. FROM	DEPTH PT. TO	RUN PT.	RUN REC'V'Y PT.	REC'V'Y %	DRILLING BEHAVIOR: FEED	DRILLING BEHAVIOR: WATER	DRILLING BEHAVIOR: REASON FOR PULL	ACTUAL DRILLING TIME	BIT NO. SIZE AND TYPE	ADDITIONAL REMARKS
5/17/65	21.0'	23.75'	2.75'	1.5'		CONTINUOUS	NO LOSS	JAMMED CORE BARREL	35 min	4" ID CORE BARREL	CORED COBBLES AND BOULDERS FROM 21.0' - 26.0' DOWN PRESSURE INCREASED FROM 100 - 450 LBS
5/17/65	23.75'	25.0'	1.25'	0	0	CONTINUOUS	NO LOSS		34 min		
5/17/65	25.0'	26.0'	1.0'	.5'	50%	CONTINUOUS	NO LOSS		65 min		
5/20/65	31.0'	36.0'	5.0'	3.0'	60%	CONT.	LOSS AT 33.0'		min/ft 10.0 11.0 11.0 10.5 11.0		CORED QUARTZ BOULDER FROM 31.0' - 32.0'

TOTAL BED ROCK DRILLED 4.0' FEET

TOTAL BED ROCK RECOVERED 2.0' FEET

BED ROCK RECOVERY 50% PERCENT

DRILLER Raymond Brown

INSPECTOR Mark A. Ahrens

NED FORM 130

FIG. No. 5

PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MA. DATE: 5/20/85

LOCATION (STA): FD-85-1 (11) OFFSET FROM CENTER LINE: 5.0' NORTH PIEZ NO.: PZ - 2

PIEZ TYPE: CASAGRANDE DEPTH OF PIEZ: -29.5' RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): SILTY GRAVELLY SAND SOIL SAMPLE NO.: S5 BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 4" x 5.0' THREADED STEEL PIPING VENT: THREADED STEEL CAP

GROUND ELEV.: 484.0' ELEV. TOP OF RISER: 485.0' ELEV PIEZ TIP: 458.5' ?

FILTER: #45 OTTOWA SAND FROM ELEV: 459.0' TO ELEV: 458.5'

SEAL: BENTONETE FROM ELEV: 458.5' TO ELEV: 463.0'

INSTALLED BY: MOBEL DRILL CONTRACT NO.: FOREMAN: RAYMOND BROWN

DATE OF INSTALLATION: 5/20/85 DATE OF OBSERVATIONS: 6/4/85

METHOD OF TESTING PIEZ.:

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
2:01	1	—						
2:06	5	—						
2:11	10	—						
2:16	15	—						
2:31	30	—						

REMARKS: IMMEDIATE WATER LOSS.

Mark A Chieno
INSPECTOR

PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MA. DATE: 5/20/85

LOCATION (STA): FD-85-1(A) OFFSET FROM CENTER LINE: 5.0' NORTH PIEZ NO.: PZ-1

PIEZ TYPE: CASAGRANDE DEPTH OF PIEZ: -14.0' RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN SOIL (SOIL TYPE): GRAVELLY SILTY SAND SAMPLE NO.: 3 BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 4" THREADED STEEL PIPING VENT: THREADED STEEL CAP

GROUND ELEV.: 484.0' ELEV. TOP OF RISER: 485.0' ELEV PIEZ TIP: 470.0'

FILTER: #45 OTTOWA SAND FROM ELEV: ~~470~~ 463.0 changed 4/3/95 see pg 2 of 10 TO ELEV: 473.0' ASSUMED on 4/3/95

SEAL: BENTONETE FROM ELEV: 473.0' TO ELEV: 477.0

INSTALLED BY: MOBEL DRILL CONTRACT NO.: FOREMAN: Raymond BROWN

DATE OF INSTALLATION: 5/20/85 DATE OF OBSERVATIONS: 6/4/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
2:00	1	16.0'						
2:05	5	16.0'						
2:10	10	16.0'						
2:15	15	16.0'						
2:30	30	16.0'						

REMARKS: WATER DROPPED FROM GROUND SURFACE TO A DEPTH OF 16.0' IMMEDIATELY UPON DISCONTINUATION OF PVC BEING FILLED.

Mark A. Owens
INSPECTOR

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. 0017

Site HODGES VILLAGE OXFORD, MASS. Page 1 of 9 Pages

Hole No. FD-85-1(B) Diam. (Casing) 6" + 4" Boring Started 5/21/85

Co-ordinates: N _____ E _____ Boring Completed 5/22/85

Drilled by MOBILE DISTRICT Report Submitted _____

Purpose of Exploration PIEZOMETER INSTALLATIONS TO DETERMINE THE PHREATIC SURFACE, PORE PRESSURES, AND PERMEABILITIES.

Elevation Top of Hole 483.0' ± M.S.L. Casing Left in Place _____ Feet
Total Overburden Drilled 37.0' Feet
Elevation Top of Rock 446.0' ± M.S.L.
Elevation Bottom of Hole 446.0' ± M.S.L.
Total Rock Drilled - Feet
Total Depth of Hole 37.0' Feet
Core Recovered - %
Core Recovered - Ft.: - Dia. - In.
Soil Samples 1 3/4" In. Dia. 8 No.
Soil Samples _____ In. Dia. _____ No. Water Table Depth 14.0'

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0	3.0	REMOVAL OF ROCK REP RAP BY MANUAL METHODS
0.0	35.0	DRILLED WITH 6" ROLLER BIT AND WASHED OUT
0.0	5.0	DRILLED 6" CASING
5.0	37.0	SAMPLED WITH 1 3/8" I.D. SPLIT SPOON IN RUNS OF 2.0' AT 5.0' INTERVALS

Items

Ground Water	Back of Page 7
Boring Location Sketch	Back of Page 7
Overburden Record	Page 1-6
Rock Drilling	Page -
PIEZOMETER INSTALLATIONS	Page 8,9
	Page
	Page

Prepared by Mark A. Owens Field Data Lab. Data

Submitted by Mark A. Owens

FORM NED DEC 63 121 REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site HODGES VILLAGE DAM, OXFORD, MA Page 1 of 9 Pages

Boring No. FD-85-2 PZ-2 Desig. A Diam. (Casing) 6" + 4"

Co-ordinates. N _____ E _____

Elevation Top of Boring 483.0' ± M.S.L.
Total Overburden Drilled 37.0' Feet
Elevation Top of Rock 446.0' ± M.S.L.
Total Rock Drilled — Feet
Elevation Bottom of Boring 446.0' ± M.S.L.
Total Depth of Boring 37.0' Feet
Core Recovered — % No. Boxes —
Core Recovered — Ft : — Diam. — In.
Soil Samples 1 7/8" In. Diam. 8 No.
Soil Samples — In. Diam. — No.

Hammer Wt. 140 Boring Started 5/21/85
Hammer Drop 30"
Casing Left —
Boring Completed 5/22/85
Subsurface Water Data — Page 7
Obs. Well —
Drilled By MOBILE DISTRICT
Mfg. Des. Drill —
Inspected By: Mark H. Ahrens
Classification By: Mark H. Ahrens
Classification By: —

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0					REP RAP REMOVED FROM 0.0' - 3.0' BY MANUAL METHODS. DRILLED 6" CASING FROM 0.0' - 5.0'. 6" DIAMETER ROLLER BIT FROM 0.0' - 5.0' AND WASHED OUT (DOWN PRESSURE BOOMS)	ROCK REP RAP
1						
2						
3						GRAVELLY SILTY SAND COARSE TO FINE, MOSTLY FINE 20-25% NON PLASTIC FINES 10-15% SUB ANGULAR GRAVEL SOME ROCK FRAGMENTS. BROWN, DAMP (SM)
4						
5						

GENERAL REMARKS:
TOP OF ROCK ESTIMATED AT ELEVATION 446.0'±

Site: HODGES VILLAGE OXFORD, MA

Boring No. FD-85-2 (B)

DEPTH (ft)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
5			5.0	2/7	SAMPLED FROM 5.0 - 6.5' WITH 1 3/8" x 2.0' SPLIT SPOON SAMPLED WITH 140LB HAMMER REFUSAL AT 6.5'	
6	1	1 3/8"	TO 6.5'	83	6" ROLLER BIT FROM 5.0' - 10.0' AND WASHED OUT	
			183	100" Ref.		
			6.5'	14" Rec		
7						
8						
9						
10			10.0		SAMPLED WITH 1 3/8" I.D. SPLIT SPOON FROM 10.0 - 10.5' WITH 140LB HAMMER REFUSAL AT 10.5'	
	2	1 3/8"	TO 10.5'	100" Ref.		SAME AS Sample #1
				8" Rec	6" ROLLER BIT FROM 10.0' TO 15.0' AND WASHED O.T.	
11						
12						

Site: HODGES VILLAGE
OXFORD, MA.

Boring No. FD-85-2 (B)

DEPTH (ft)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
5			5.0	4/7	SAMPLED FROM 5.0 - 6.5' WITH 1 3/8" x 2.0' SPLIT SPOON SAMPLED WITH 140LB HAMMER REFUSAL AT 6.5'	
	1	1 3/8"	TO 6.5'	83	6" ROLLER BIT FROM 5.0' - 10.0' AND WASHED OUT	
6			183	100" Ref.		
			6.5'	14" Rec		
7						
8						
9						
10			10.0		SAMPLED WITH 1 3/8" O.D. SPLIT SPOON FROM 10.0' - 10.5' WITH 140LB HAMMER REFUSAL AT 10.5'	
	2	1 3/8"	TO 10.5'	100" Ref.		SAME AS Sample #1
				5" Rec	6" ROLLER BIT FROM 10.0' TO 15.0 AND WASHED OUT.	
11						
12						
13						

Site: HODGES VILLAGE OXFORD, MM

Boring No. ED-85-2 (B)

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
14						
15			15.0'	51	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 15.0' TO 17.0' WITH 140LB HAMMER	GRAVELLY SILTY SAND COARSE TO FINE, MOSTLY MEDIUM 20-25% NON PLASTIC FINES 15-25% SUB ANGULAR GRAVEL ABUNDANT ROCK FRAGMENTS GRAY, MOIST (SM)
			96	43	6" ROLLER ROCK FROM 15.0' TO 20.0' AND WASHED OUT.	
16	3	1 7/8"	TO	53		* STRONG ODOR OF DECAY PRESENT.
				50		
17			17.0'	7" Rec.		
18						
19						
20			20.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 20.0 - 20.5' WITH 140LB HAMMER. REFUSAL AT 20.5' RECOVERY NEGLIGEBLE	SAMPLE TO SMALL FOR CLASSIFICATION
	4	1 7/8"	TO	100 / Ref.		
			20.5'	1" Rec.		
					6" ROLLER ROCK FROM 20.0' TO 25.0' AND WASHED OUT.	
21						
22						

Site: HODGES VILLAGE OXFORD, MA

Boring No. FD-85-2 (B)

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
23						
24						
25			25.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 25.0' TO 27.0' WITH 140LB HAMMER.	MEDIUM TO FINE SAND MEDIUM TO FINE <5% NON PLASTIC FINES TRACE SUB ANGULAR GRAVEL. GRAY-BROWN MOIST (SP)
				18		
26	5	1 7/8"	31	17	6" ROLLER BIT FROM 25.0' TO 30.0' AND WASHED OUT.	
				14		
				15"		
27			27.0'	10"/6"		
28						
29						
30			30.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 30.0' - 32.0' WITH 140LB HAMMER.	GRAVELLY SAND COARSE TO FINE MOSTLY FINE 15"-30% SUB ANGULAR GRAVEL
	6	1 7/8"	TO 30.5'	25		

Site: HODGES VILLAGE
OXFORD, MA.

Boring No. FD-85-2 (B)

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
			30.5		6" ROLLER ROCK FROM 30.0 - 35.0 AND WASHED OUT.	10 - 15% N.P. FINES RED BROWN DRY (sp-sm)
31				26		
			31			FINE SAND
	7	1 7/8"	TC	28		FINE GRAINED 10-15% NON PLASTIC FINES <10% SUB ROUNDED GRAVEL DARK BROWN TO BLACK MOIST. (sp-sm)
				24		
32			32.0			
				14" Rec.		
33						
37						
35			35.0		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 35.0' - 37.0' WITH 140LB HAMMER.	GRAVELLY SILTY SAND
				20		COARSE TO FINE 20-25% NON PLASTIC FINES 15-20% SUB ANGULAR GRAVEL ABUNDANT ROCK FRAGMENTS BROWN - GRAY MOIST (sm)
			35			
				45		
36	8	1 7/8"	TC			
				30		
				82		
37			37.0	14" Rec.	FINAL OVERBURDEN SAMPLE END DEPTH 37.0'	BOTTOM OF BORING 37.0'

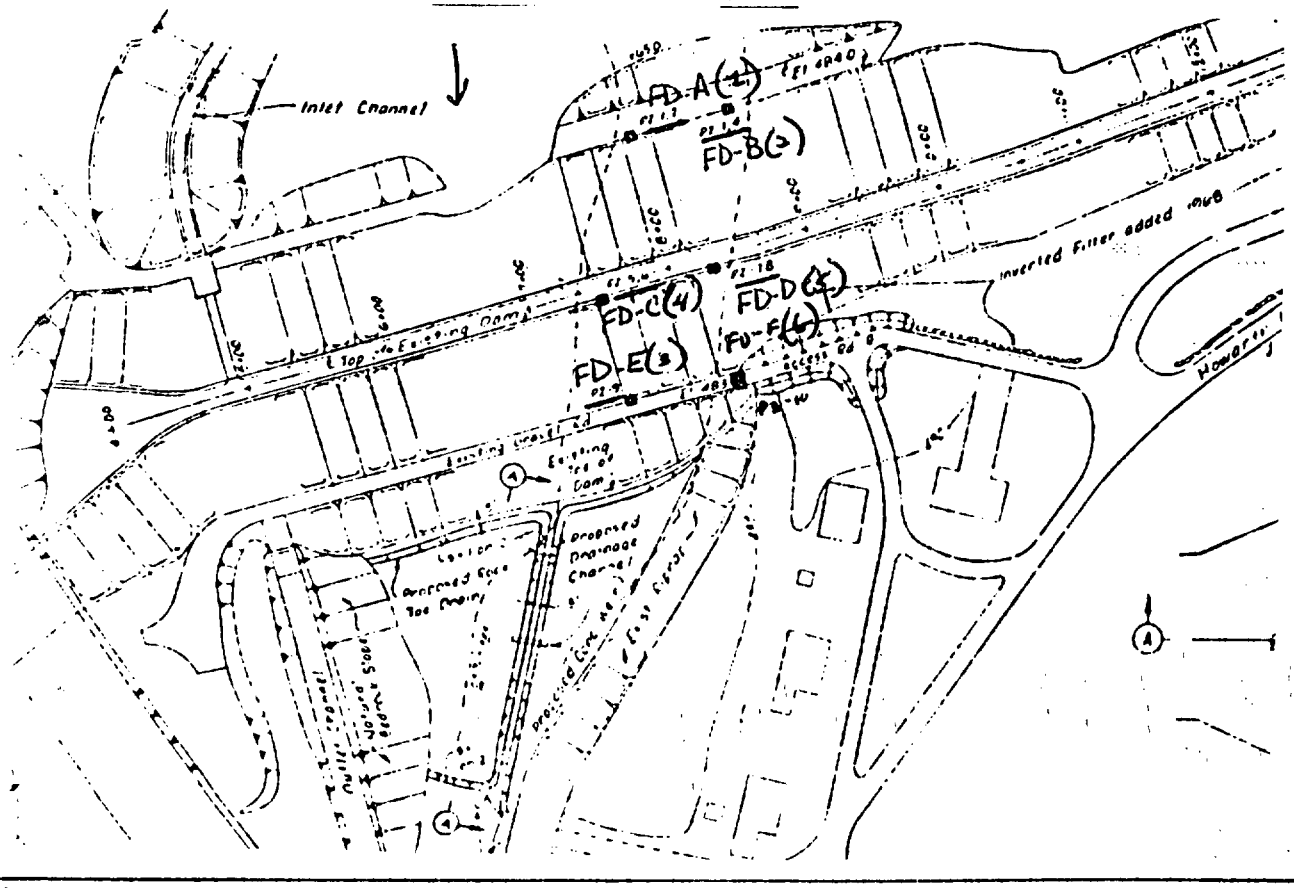
Site: HODGES VILLAGE OAKDALE, MINN.
Boring No: FD-GS-2 (B)

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
5/24/65	10:00AM	—	37.0'	14.0'	469.0'±	
6/6/65	10:30AM	—	37.0'	15.7'	467.3'±	WATER LEVEL MEASURED IN PZ-3

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MM. | DATE: 5/12/65

LOCATION (STA): FD-65-2(13) | OFFSET FROM CENTER LINE: 50' NORTH | PIEZ NO.: PZ-3

PIEZ TYPE: CASAGRANDE | DEPTH OF PIEZ: 33.0 | RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): GRAVELLY SILTY SAND | SOIL SAMPLE NO.: 8 | BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 4" x 5.0' THREADED STEEL PIPING | VENT: THREADED STEEL CAP

GROUND ELEV.: 484.0'± | ELEV. TOP OF RISER: 485.0'± | ELEV PIEZ TIP: 452.0'

FILTER: SELECT #45 | FROM ELEV: ~~452.0~~ 447.0 changed 4/14/65 | TO ELEV: 459.0'

SEAL: BENTONITE | FROM ELEV: 459.0' | TO ELEV: 464.0'

INSTALLED BY: EASTERN GEOTECH + MOBILE DIV. | CONTRACT NO.: | FOREMAN: Raymond Brown

DATE OF INSTALLATION: 5/12/65 | DATE OF OBSERVATIONS: 6/4/65

METHOD OF TESTING PIEZ.:

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
2:16	1	15.1						
2:21	5	15.1						
2:26	10	15.1						
2:31	15	15.1						
2:46	30	15.1						

REMARKS:

Mark A. Owens
INSPECTOR

PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MA. DATE: 5/22/85

LOCATION (STA): FD-85-2(B) OFFSET FROM CENTER LINE: 5.0 NORTH PIEZ NO.: PZ-4

PIEZ TYPE: CASAGRANDE DEPTH OF PIEZ: -14.0' RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): GRAVELLY SALTY SAND SOIL SAMPLE NO.: 2 BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 5'0" 4" DIAMETER THREADED PIPE VENT: THREADED STEEL CAP

GROUND ELEV.: 474.0' ± ELEV. TOP OF RISER: 475.0' ± ELEV PIEZ TIP: 470.0' ±

FILTER: SELECT #45 FROM ELEV: ~~470.0~~ 469.0 Changed 4/4/95 ± TO ELEV: 474.0' ±

SEAL: BENTONITE FROM ELEV: 474.0' ± TO ELEV: 475.0' ±

INSTALLED BY: EGI + MOBILE DISTRICT CONTRACT NO.: FOREMAN: Raymond Brown

DATE OF INSTALLATION: 5/22/85 DATE OF OBSERVATIONS: 6/4/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
2:17	1	10.8'						
2:22	5	10.8'						
2:27	10	10.8'						
2:32	15	10.8'						
2:47	30	10.8'						

REMARKS: WATER LEVEL IMMEDIATELY DROPPED TO 10.8' AND REMAINED THERE THROUGHOUT THE TEST.

Mark A Owens
INSPECTOR

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. 0007

Site HODGES VILLAGE DAM, OXFORD, MA. Page 1 of 9 Pages

Hole No. FD-85-3(E) Diam. (Casing) 6" + 4" Boring Started 5/22/85

Co-ordinates: N _____ E _____ Boring Completed 5/23/85

Drilled by MOBILE DISTRICT Report Submitted _____

Purpose of Exploration PIEZOMETER INSTALLATIONS TO DETERMINE THE PHREATIC SURFACE, PORE PRESSURES, AND PERMEABILITIES.

Elevation Top of Hole 483.0'± M.S.L. Casing Left in Place 26.0' Feet

Total Overburden Drilled 36.0' Feet

Elevation Top of Rock 447.0'± M.S.L.

Elevation Bottom of Hole 447.0'± M.S.L.

Total Rock Drilled — Feet

Total Depth of Hole 36.0' Feet

Core Recovered — %

Core Recovered — Ft.: — Dia. — In.

Soil Samples 17/8" In. Dia. 8 No.

Soil Samples _____ In. Dia. ____ No. Water Table Depth 14.1'

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0'	5.0'	DRILLED 6" CASING
5.0'	35.0'	6" ROLLER BIT AND WASHED OUT
0.0'	26.0'	4" CASING LEFT IN PLACE
5.0	36.0	SAMPLED WITH 1 7/8" I.D. SPLIT SPOON EN 5.0' INTERVALS

Items

Ground Water _____ Back of Page 7

Boring Location Sketch _____ Back of Page 7

Overburden Record _____ Page 1-6

Rock Drilling _____ Page —

PIEZOMETER INSTALLATION Page 8

_____ Page ____

_____ Page ____

Prepared by Mark A. Owens
Field Data Lab. Data

Submitted by Mark A. Owens

FORM MED DEC 63 121 REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site HODGES VILLAGE OXFORD, MA Page 2 of 8 Pages
PZ-5
Boring No. FD-85-3 Desig. E Diam. (Casing) 6" + 4"
Co-ordinates. N _____ E _____

Elevation Top of Boring 483.0' ± M.S.L.
Total Overburden Drilled 36.0' Feet
Elevation Top of Rock 487.0' ± M.S.L.
Total Rock Drilled — Feet
Elevation Bottom of Boring 447.0' ± M.S.L.
Total Depth of Boring 36.0' Feet
Core Recovered _____ % No. Boxes _____
Core Recovered _____ Ft : _____ Diam. _____ In.
Soil Samples 1 3/8" In. Diam. 5 No.
Soil Samples _____ In. Diam. _____ No.

Hammer Wt. 140 lb Boring Started 5/22/85
Hammer Drop 30"
Casing Left 20.0' of 4" Boring Completed 5/23/85
Subsurface Water Data _____ Page 7
Obs. Well _____
Drilled By MOBILE DISTRICT
Mfg. Des. Drill _____
Inspected By: Mark A. Owens
Classification By: Mark A. Owens
Classification By: _____

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1' = 5					DRILLED 6" CASING FROM 0.0' -- 5.0' 4" ROLLER BIT FROM 0.0' TO 5.0' (DOWN PRESSURE 300 LBS) AND WASHED OUT.	

GENERAL REMARKS:

Site: HODGES VILLAGE
OXFORD, MA.

Boring No. FD-85-3 (E)

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DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
5			5.0	8	SAMPLED WITH 1 3/4" x 2.0' SPLIT SPOON FROM 5.0' - 7.0' WITH 140 LB HAMMER.	SILTY GRAVEL ANGULAR TO SUB ROUNDED 20-30% NON PLASTIC FINES GRAY, MOIST ROCK FRAGS. [ROCK FILL] (GM)
				6	6" ROLLER BIT FROM 5.0' TO 10.0' AND WASHED OUT.	
6	1	1 7/8"	TO	10		
				4		
				8		
7			7.0'	10" REC.		
8						
9						
10			10.0'		SAMPLED WITH 1 3/4" x 2.0' SPLIT SPOON FROM 10.0' - 12.0' WITH 140 LB HAMMER	SILTY GRAVEL ANGULAR TO SUB ROUNDED 30-40% NON PLASTIC FINES GRAY-BROWN GRAY, DAMP ABUNDANT WEATHERED ROCK FRAGS. [ROCK FILL] (GM)
				8		
			9"		DRILLED 4" CASING FROM 10.0' - 12.0'.	
				57	4" ROLLER BIT FROM 10.0' TO 12.0' AND WASHED OUT.	
11	2	1 7/8"	TO			
				36		
				20		
12			12.0'	24" REC.	DRILLED 4" CASING FROM 12.0' - 16.0'.	
					4" ROLLER BIT FROM 12.0' - 16.0' AND WASHED OUT	
13						

Site: HODGES VILLAGE
OXFORD, MD.

Boring No. FD-85-3 (E)

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
14						
15			15.0'			SILTY GRAVEL SAME AS SAMPLE #2 [ROCK FILL] (Gm)
	3	1 7/8"	TO	37		
				100" Ref.		
16			16.0'	6" Rec.	4" ROLLER BIT FROM 16.0' TO 19.0' AND WASHED OUT. DRILLED 4" CASING FROM 16.0' TO 17.5'.	
17						
					DROVE 4" CASING FROM 17.5' TO 20.5' WITH 140 LB HAMMER.	
300 18						BASE OF ROCKFILL ZONE
						SAND
175 19			19.0'	10	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 19.0' TO 21.0' WITH 140 LB HAMMER.	MEDIUM TO FINE MOSTLY FINE. TRACE NON PLASTIC FINES BROWN, MOIST (Sp)
	4	1 7/8"	TO	28	4" ROLLER BIT FROM 19.0' TO 25.0' AND WASHED OUT.	
170 20			55	27		
			20.5'			GRAVELLY SILTY SAND
	5	1 7/8"	TO	31		COARSE TO FINE MOSTLY FINE 20-30% NON PLASTIC FINES 20-30% SUB ROUNDED GRAVEL BROWN - RED BROWN, DAMP (Sm)
21			21.0'	24" Rec.		
22						

Boring No. FD-85-3(E)

Site: HODGES VILLAGE
OXFORD, MA.

Boring No. FD-85-3 (E)

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATER ALS
23						
24						
25			25.0		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 25.0 -- 26.25' WITH 140 LB HAMMER.	SILTY SAND
				34		COARSE TO FINE
					4" ROLLER ROCK FROM 25.0' - 30.0' AND WASHED OUT.	30-35% NON PLASTIC FINES
	6	17/8"	TO	69		<10% SUB ROUNDED GRAVEL
26				100+		BROWN-GRAY (sm)
			26.25'	26.25 Ref.		
				13" Rec.		
27						
28						
29						
30					SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 30.0 - 32.0' WITH 140 LB HAMMER	SAND
				20		FINE GRAINED
						10-15% NON PLASTIC FINES
						GRAY, MOIST (sp-sm)

Site: HODGES VILLAGE, OXFORD, MA.

Boring No. FD-85-3 (E)

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DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
31	7	1 7/8"	31.0 TO 32.0	22 32 35 14" Rec.	4" ROLLER BIT FROM 30.0' - 35.0'. HAND WASHED OUT. 54	
32			32.0			
33						
34						
35	8	1 7/8"	35.0 TO 36.0	30 100+ Rec.	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 35.0' - 36.0' WITH 140 LB HAMMER.	SILTY SAND MEDIUM TO FINE MOSTLY FINE 20-30% NON PLASTIC FINES SOME SUB ROUNDED GRAVEL ABUNDANT WEATHERED ROCK FRAGMENTS GRAY - BROWN (SM)
36			36.0'	8" Rec.	FINAL OVERBURDEN SAMPLING DEPTH 36.0'	BOTTOM OF BORING 36.0'

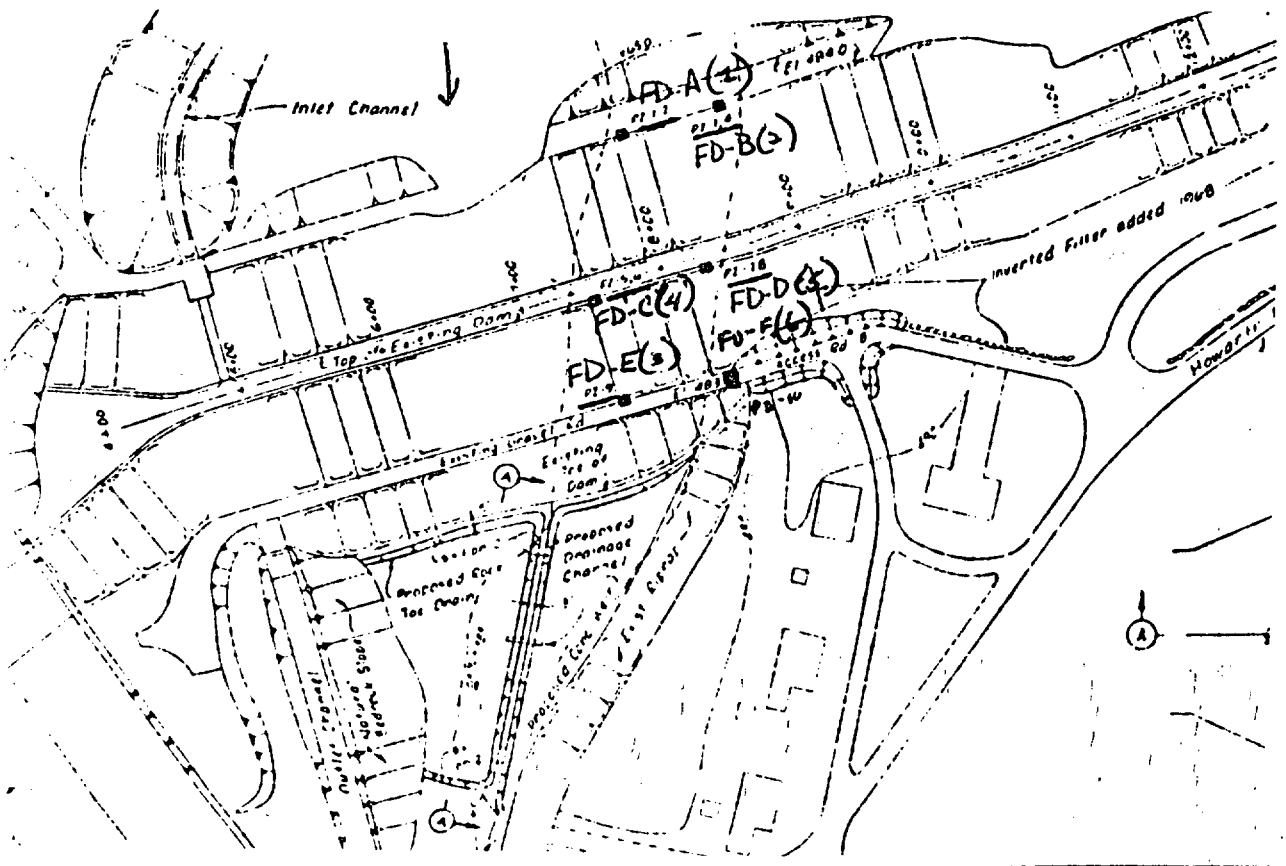
Site: HODGES VILLAGE DAM, MA.
Boring No: FD-55-3 (E)

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
5/23/55	1:00pm	20.0'	36.0'	13.5'	469.5'±	
6/5/55	11:00AM	20.0'	36.0'	14.1'	468.9'±	
6/10/55	1:00pm	20.0'	36.0'	14.1'	468.9'±	

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



FORM 59(Test)
R 7-55

Boring No. FD-55-3(E)

PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MA | DATE: 5/23/85

LOCATION (STA): FD-85-3(E) | OFFSET FROM CENTER LINE: 10.0' SOUTH | PIEZ NO.: PZ-9

PIEZ TYPE: CASAGRANDE | DEPTH OF PIEZ: -32.0' | RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN SOIL TYPE): SILTY SAND | SOIL SAMPLE NO.: S | BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 26.0' of 4" CASING and 2.0' UNSLOTTED PIPE | VENT: GATE BOX COVER

GROUND ELEV.: 483.0'± | ELEV. TOP OF RISER: 483.0' | ELEV PIEZ TIP: 454.0

FILTER: #45 SELECT SAND | FROM ELEV: ~~447.0~~ 447 BOH 4/5/85 | TO ELEV: 459.0'

SEAL: BENTONITE | FROM ELEV: 459.0' | TO ELEV: 463.0'

INSTALLED BY: MOBILE DRILL | CONTRACT NO.: | FOREMAN: RAYMOND BROWN

DATE OF INSTALLATION: 5/23/85 | DATE OF OBSERVATIONS: 6/4/85

METHOD OF TESTING PIEZ.:

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1:13	1	14.1'						
1:18	5	14.1'						
1:23	10	14.1'						
1:28	15	14.1'						
1:43	30	14.1'						

REMARKS:

Mark A. Owens
INSPECTOR

CORPS OF ENGINEERS, U. S. ARMY

NEW ENGLAND DIVISION

FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. 60-7

Site CEDARS VILLAGE OXFORD, MA. Page 1 of 13 Pages

Hole No. FD-85-7(C) Diam. (Casing) 6" & 4" Boring Started 5/24/85

Co-ordinates: N _____ E _____ Boring Completed 5/30/85

Drilled by MOBILE DISTRICT Report Submitted _____

Purpose of Exploration PIEZOMETER INSTALLATIONS TO DETERMINE PHREATIC SURFACE CONDITIONS, PORE PRESSURES, AND PERMEABILITIES.

Elevation Top of Hole 519.0'± M.S.L. Casing Left in Place — Feet

Total Overburden Drilled 71.0' Feet

Elevation Top of Rock — M.S.L.

Elevation Bottom of Hole 548.0'± M.S.L.

Total Rock Drilled — Feet

Total Depth of Hole 71.0' Feet

Core Recovered — %

Core Recovered _____ Ft.; _____ Diam. _____ In.

Soil Samples 1 3/8" In. Diam. 13 No.

Soil Samples _____ In. Diam. _____ No. Water Table Depth 50.0'±

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0	3.0'	REMOVED ASPHALT, BOULDERS, AND COBBLES BY HAND. DRILLED 6" CASING
3.0	10.0'	
3.0	70.0	6" ROLLER BIT 5'± INTERVALS WASHING OUT EVERY 5'±
10.0'	71.0	1 3/8" I.D. SPLIT SPOON SAMPLES EVERY 5.0' RUNS

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Overburden Record _____ Page 1-10

Rock Drilling — Page —

PIEZOMETER INSTALLATIONS Page 12&13

_____ Page _____

_____ Page _____

Prepared by Mark A. Olsen
Field Data

Submitted by Mark A. Olsen

Lab. Data

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site HODGES VILLAGE OXFORD, MA. Page 2 of 13 Pages

PZ-3

Boring No. ED-85-4 Desig. C Diam. (Casing) 6" & 4"

Co-ordinates. N _____ E _____

Elevation Top of Boring 519.0' ± M.S.L.
Total Overburden Drilled 71.0' Feet
Elevation Top of Rock — M.S.L.
Total Rock Drilled — Feet
Elevation Bottom of Boring 448.0' ± M.S.L.
Total Depth of Boring 71.0' Feet
Core Recovered ____ % No. Boxes ____
Core Recovered ____ Ft : ____ Diam. ____ In.
Soil Samples 1 7/8" In. Diam. 13 No.
Soil Samples ____ In. Diam. ____ No.

Hammer Wt. 140 lbs. Boring Started 5/24/85
Hammer Drop 30"
Boring Completed 5/30/85
Casing Left —
Subsurface Water Data ____ Page 11
Obs. Well ____
Drilled By MOBILE DISTRICT
Mfg. Des. Drill ____
Inspected By: Mark A. Owens
Classification By: Mark A. Owens
Classification By: ____

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1					REMOVED ROCK RIP RAP FROM 0.0' - 3.0' BY MANUAL MEANS. DRILLED 6" CASING FROM 3.0' - 10.0' (DOWN PRESSURE 150-200 lbs)	Rock RIP RAP
2						
3					6" ROLLER BIT FROM 3.0' - 5.0' AND WASHED OUT.	
4						
5						

GENERAL REMARKS:

Site: HODGES VILLAGE
OXFORD, MA.

Boring No. FD-85-4 (c)

DEPTH (ft)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
5					6" ROLLER BIT FROM 5.0'-10.0' AND WASHED OUT. DRILLED 6" CASING FROM 5.0'-10.0'	
6						
7						
8						
9						
10			10.0'	11	SAMPLED WITH 1 3/8" x 2.0' SPLIT SPOON FROM 10.0'-12.0' WITH 140 LB HAMMER.	GRAVELLY SILTY SAND COARSE TO FINE MOSTLY MEDIUM TO FINE. 15-25% NON-PLASTIC FINES. 10-15% SUB ANGULAR GRAVEL. BROWN, MOIST (SM)
11	1	1 3/8"	TO	8	6" ROLLER BIT FROM 10.0'-15.0' AND WASHED OUT. 16	
				8		
12			12.0'	12		
				8" Rec.		
13						

Site: HODGES VILLAGE OXFORD, MA.

Boring No. FD-85-4 (c)

DEPTH (ft)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
14						
15			15.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 15.0' TO 17.0' WITH 140 LB HAMMER.	GRAVELLY SILTY SAND
				26	6" ROLLER BIT FROM 15.0' TO 20.0' AND WASHED OUT.	SAME AS SAMPLE #1 MORE ABUNDANT SUB-AGULAR GRAVEL (sm)
				28		
16	2	1 7/8"	TO	13		
				45		
				30		
17			17.0'	12" Rec.		
18						
19						
20			20.0		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 20.0' - 22.0' WITH 140 LB HAMMER.	GRAVELLY SILTY SAND
				33	6" ROLLER BIT FROM 20.0' - 25.0' AND WASHED OUT.	SAME AS SAMPLE #2
				100		
21	3	1 7/8"	TO	179		
				79		
				90		
22			22.0'	11" Rec.		

Site: HODGES VILLAGE
OXFORD, MA.

Boring No. FD-85-4 (c)

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATER ALS
23						
24						
25			25.0'	28	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 25.0' - 27.0' WITH 140 LB HAMMER. 6" ROLLER BIT FROM 25.0' - 30.0' AND WASHED OUT.	GRAVELLY SILTY SAND SAME AS #2
26	4	1 7/8"	TO	42	89	
				47		
27			27.0'	67		
				18" Rec.		
28						
29						
30			30.0'	30	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 30.0' - 32.0' WITH 140 LB HAMMER.	SAND MOSTLY FINE GRAINED. <10% NON PLASTIC FINES TRACE GRAVEL BROWN AND GRAY, DAMP (SP)

Site: HODGES VILLAGE OXFORD, MM.

Boring No. FD-85-4 (c)

DEPTH (ft)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
				46	6" ROLLER ROCK FROM 30.0' TO 35.0' AND WASHED OUT.	
31				109		
	5	1 7/8"	TO	63		
				77		
32			32.0	13" Rec.		
33						
34						
35			35.0'	31	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 35.0' TO 37.0' WITH 140LB HAMMER.	GRAVELLY SILTY SAND SAME AS SAMPLE #2. (SM)
				49	6" ROLLER ROCK FROM 35.0' TO 40.0' AND WASHED OUT.	
36	6	1 7/8"	TO	73	122	
				69		
37			37.0	13" Rec.		
38						
39						

Site: HODGES VILLAGE OXFORD, MA.

Boring No. FD-SS-4 (C)

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DEPTH 1"=	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
40			40.0'		SAMPLED WITH 1 3/8" X 2.0' SPLIT SPOON FROM 40.0' TO 41.5' WITH 140LB HAMMER.	GRAVELLY SILTY SAND SAME AS SAMPLE #2 (SM)
				37		
	7	1 3/8"	TO	62	6" ROLLER ROCK FROM 40.0' TO 46.0' AND WASHED OUT. 16T	
41				100+		
			41.5	4" Rec.		
42						
43						
44						
45			45.0'		SAMPLED WITH 1 3/8" X 2.0' SPLIT SPOON FROM 45.0' - 46.0' WITH 140LB HAMMER.	GRAVELLY SILTY SAND SAME AS SAMPLE #2 GRAY IN COLORATION (SM)
				57		
	8	1 3/8"	TO		6" ROLLER ROCK FROM 45.0' TO 50.0' AND WASHED OUT. 15T	
				100+		
46			46.0'	10" Rec.		
47						

A (Test)

Boring No. FD-SS-4(C)

Site: HUGHES VILLAGE
OXFORD, MA.

Boring No. FD-85-4 (c)

DEPTH (ft)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
49						
50			50.0'		SAMPLED WITH 1 7/8" x 3.0' SPLIT SPOON FROM 50.0 TO 51.5' WITH 140LB HAMMER.	GRAVELLY SILTY SAND
				48		SAME AS SAMPLE #2 (SM)
					6" ROLLER ROCK FROM 50.0 TO 55.0' AND WASHED OUT.	
	9	1 7/8"	TO	66		
51					160*	
				100*		
			51.0'	13" Rec.		
52						
53						
54						
55			55.0'		SAMPLED WITH 1 7/8" x 3.0' SPLIT SPOON FROM 55.0' TO 57.0' WITH 140 LB HAMMER.	SAND FINE GRAINED, 3% NON PLASTIC FINES. TRACE GRAVEL GRAY, MOIST (SP)
	10	1 7/8"	TO	41		
			55.5'	13" Rec.	6" ROLLER ROCK FROM 55.0' TO 56.0' AND WASHED OUT.	
56				90		

Site: HODGES VILLAGE OXFORD, MA

Boring No. ED-85-4 (c)

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATER ALS
57	11	1 7/8"	TO 56.5'	100T 56.5' 10" REC.	140 X	SILTY SANDY GRAVEL ANGULAR TO SUBROUNDED 10-15% FINE SAND 5-10% NON PLASTIC FINES GRAY, BROWN MOIST (GP-GM)
58						
59						
60			60.0'		SAMPLED WITH 1 7/8" X 2.0' SPLIT SPOON FROM 60.0' TO 62.0' WITH 140 LB HAMMER.	SILTY GRAVELLY SAND COARSE TO FINE, MOSTLY FINE. 30-40% ANGULAR TO SUBROUNDED GRAVEL. 10-20% NON PLASTIC FINES GRAY-BROWN, MOIST. (SM)
				35		
61	12	1 7/8"	TO	43	86	
				43		
				96		
62			62.0'	18" REC.		
63						
64						

(Test)

Boring No. ED-85-4(c)

Site HODGES VILLAGE OXFORD, MS.

Boring No. FA-85-4 (C)

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DEPTH (ft)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
65	13	1 7/8"	65.0' to 66.0'	43 / 100+ / 3" rec.	SAMPLED WITH 1 7/8" x 3.0' SPLIT SPOON FROM 65.0' TO 66.0' WITH 140 LB HAMMER. 6" RELIEF ROCK FROM 65.0' TO 70.0' AND WASHED OUT. HS	GRAVELLY SILTY SAND MEDIUM TO FINE, MOSTLY FINE. 20-25% NON PLASTIC FINES 10-15% ANGULAR TO SUBROUNDED GRAVEL. GRAY-BROWN, MOIST (SM)
66						
67						
68						
69						
70	14	1 7/8"	70.0' to 71.0'	61 / 100+ / 9" rec.	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 70.0' TO 71.0' WITH 140 LB HAMMER. HS	SILTY SAND MEDIUM TO FINE, MOSTLY FINE. 25-30% NON PLASTIC FINES. 5-10% ANGULAR TO SUBROUNDED GRAVEL. GRAYISH-BROWN, MOIST (SM)
71			71.0'		COMPLETION OF OVERBURDEN SAMPLING OPERATIONS 71.0'	BOTTOM OF BORING 71.0'
72						

(Test)

Boring No. FA-85-4(C)

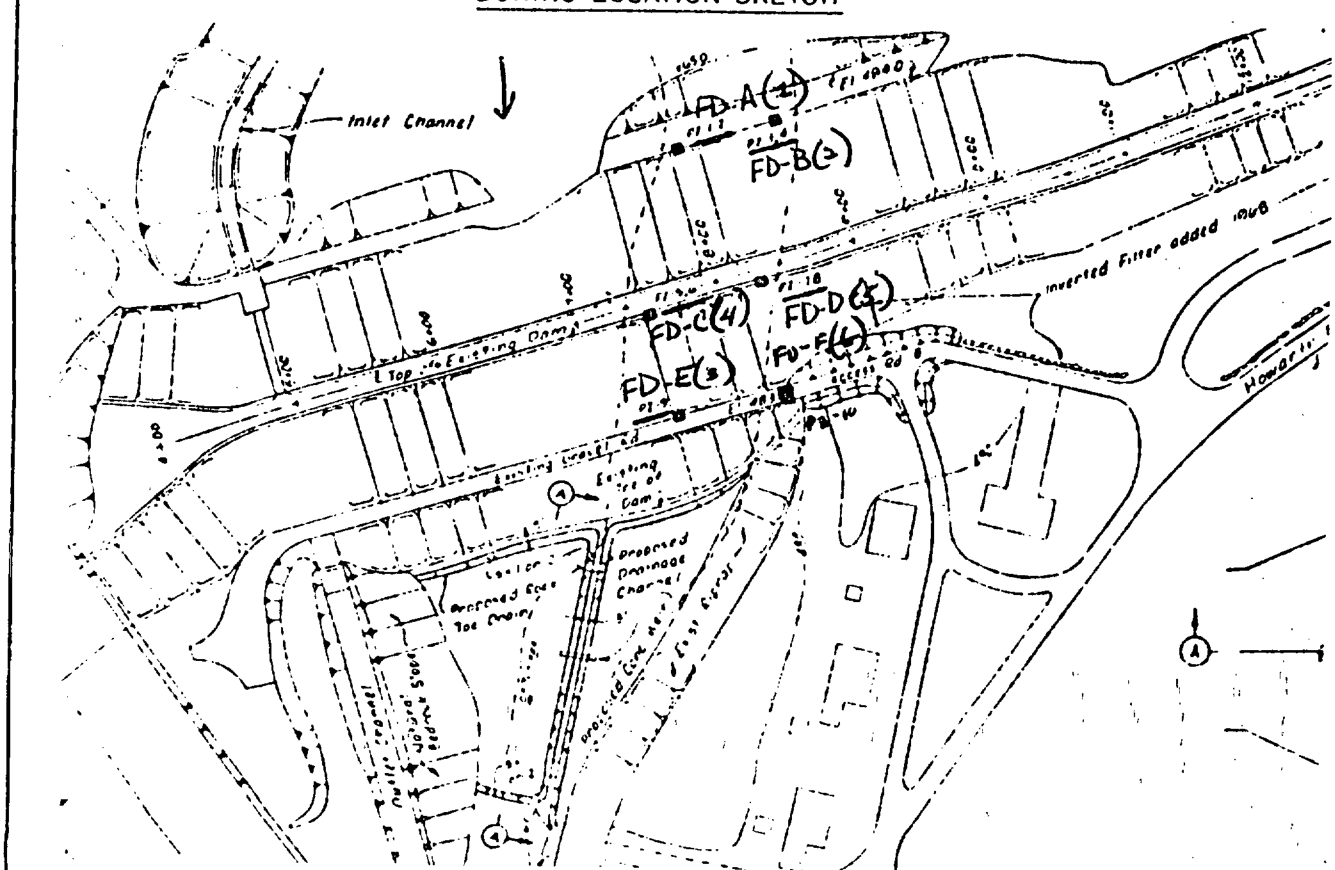
Site: HODGES VILLAGE OXFORD, MA.
Boring No: FD-85-4 (C)

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
5/30	12:00pm	10.0'	71.0'	50.0'	469.0'±	
6/4	11:30a.m	—	71.0'	52.0'	468.0'±	

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MA. | DATE: 5/30/65

LOCATION (STA): FD-65-4(C) | OFFSET FROM CENTER LINE: | PIEZ NO.: PZ-5

PIEZ TYPE: CASAGRANDE | DEPTH OF PIEZ: -68.0' | RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN SOIL (SOIL TYPE): SILTY SAND (SM) | SAMPLE NO.: 14 | BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 4" x 5.0' THREADED STEEL PIPING | VENT: THREADED STEEL CAP

GROUND ELEV.: 519.0' ± | ELEV. TOP OF RISER: 519.0' ± | ELEV PIEZ TIP: 451.0'

FILTER: #1 BLAST SAND | FROM ELEV: ~~449.0'~~ Assume 448.0 (BOH) 4/4/65 | TO ELEV: 458.0'

SEAL: BENTONITE | FROM ELEV: 458.0' | TO ELEV: 464.0'

INSTALLED BY: MOBILE DISTRICT | CONTRACT NO.: | FOREMAN: Raymond Brown

DATE OF INSTALLATION: 5/30/65 | DATE OF OBSERVATIONS: 6/4/65

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
10:47	1	27.5'						
10:52	5	51.8'						
10:57	10	51.8'						
11:02	15	51.8'						
11:17	30	51.8'						

REMARKS:

Mark A. Owens
INSPECTOR

PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MA. | DATE: 5/30/85

LOCATION (STA): FD-85-4(c) | OFFSET FROM CENTER LINE: | PIEZ NO.: PZ-6

PIEZ TYPE: CASAGRANDE | DEPTH OF PIEZ: -30.0' | RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN SOIL (SOIL TYPE): SILTY SAND (SM) | SOIL SAMPLE NO.: 9 | BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 4" x 5.0' THREADED STEEL PIPING | VENT: THREADED STEEL CAP

GROUND ELEV.: 519.0'± | ELEV. TOP OF RISER: 519.0'± | ELEV PIEZ TIP: 464.0'±

FILTER: #1 BLAST SAND | FROM ELEV: 464.0' | TO ELEV: 499.0'

SEAL: BENTONITE | FROM ELEV: 499.0' | TO ELEV: 504.0'±

INSTALLED BY: McBEE DESTREET | CONTRACT NO.: | FOREMAN: Raymond Brown

DATE OF INSTALLATION: 5/30/85 | DATE OF OBSERVATIONS: 6/4/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
10:52	1	17.4'						
10:57	5	26.25'						
11:02	10	28.0'						
11:07	15	29.5'						
11:22	30	29.75'						

REMARKS:

Mark A. Owens
INSPECTOR

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. 0027

Site HODGES VILLAGE OXFORD, MA. Page 1 of 11 Pages

Hole No. FD-65-5(6) Diam. (Casing) 6" Boring Started 5/31/65

Co-ordinates: N _____ E _____ Boring Completed 6/4/65

Drilled by MOBILE DISTRICT Report Submitted _____

Purpose of Exploration PIEZOMETER INSTALLATIONS TO DETERMINE THE PHREATIC SURFACE, PORE PRESSURES, AND PERMEABILITIES.

Elevation Top of Hole 519.0' ± M.S.L. Casing Left in Place — Feet

Total Overburden Drilled 55.25' Feet

Elevation Top of Rock — M.S.L.

Elevation Bottom of Hole 463.75' ± M.S.L.

Total Rock Drilled — Feet

Total Depth of Hole 55.25' Feet

Core Recovered — %

Core Recovered — Ft.: — Diam. — In.

Soil Samples 1 7/8" In. Diam. 10 No.

Soil Samples — In. Diam. — No. Water Table Depth 46.5'

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0'	3.0'	REMOVED ROCK RIP RAP BY MANUAL METHODS.
3.0'	10.0'	DRILLED 6" CASING
3.0'	55.0'	6" Rotary Rock and washed out.
10.0'	55.25'	SAMPLED WITH 1 7/8" O.D. SPLIT SPOON FOR RUNS OF 2.0' IN S.P. INTERVALS

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Ground Water	Back of Page 9
Boring Location Sketch	Back of Page 9
Overburden Record	Page 1-8
Rock Drilling	Page —
PIEZOMETER INSTALLATION	Page 10, 11
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	Page —

Prepared by Mack A. Owens
Field Data Lab. Data

Submitted by Mack A. Owens

FORM NED DEC 63 121 REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site HODGES VILLAGE OXFORD, MA. Page 2 of 11 Pages

Boring No. ED-85-5 Desig. PZ-4 (D) Diam. (Casing) 6"

Co-ordinates. N _____ E _____

Elevation Top of Boring 519.0'± M.S.L.
Total Overburden Drilled 55.25' Feet
Elevation Top of Rock _____ M.S.L.
Total Rock Drilled — Feet
Elevation Bottom of Boring 463.75'± M.S.L.
Total Depth of Boring 55.25 Feet
Core Recovered ____% No. Boxes ____
Core Recovered — Ft ____ Diam. ____ In.
Soil Samples 1 7/8" In. Diam. 10 No.
Soil Samples ____ In. Diam. ____ No.

Hammer Wt. MOIL Boring Started 5/31/85
Hammer Drop 30" Boring Completed 6/4/85
Casing Left —
Subsurface Water Data ____ Page 9
Obs. Well —
Drilled By MOBILE DISTRICT
Mfg. Des. Drill _____
Inspected By: Mark A. Owens
Classification By: Mark A. Owens
Classification By: _____

DEPTH	CORE/SAMPLE			BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE	DEPTH RANGE	CORE REC'VY		
0					REMOVED ROCK RIP RAP BY MANUAL METHODS FROM 0.0' TO 3.0'	
					DRILLED 6" CASING FROM 0.0' TO 10.0'.	
					6" ROLLER ROCK FROM 0.0' TO 10.0' AND WASHED OUT.	
1						
2						
3						
4						
5						

GENERAL REMARKS:

Site HODGES VILLAGE
OXFORD, MN.

Boring No. FD-85-5 (D)

DEPTH (ft)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10			10.0'		SAMPLED WITH 1⅜" x 2.0' SPLIT SPOON FROM 10.0' TO 12.0' WITH 140 LB HAMMER.	SILTY SAND COARSE TO FINE, MOSTLY FINE. 15-25% NON PLASTIC FINES. ≤ 10% SUB ROUNDED TO SUB ANGULAR GRAVEL. BROWN, DAMP (SM)
				11		
				12	6" ROLLER ROCK FROM 10.0' TO 15.0' AND WASHED OUT.	
11	1	1⅜"	TO	5		
				4		
12			12.0'	11" REC		
13						

(Test)

Boring No. FD-85-5(D)

Site: HODGES VILLAGE, OXFORD, MA.

Boring No. FD-65-5 (D)

DEPTH (Ft.)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
15			15.0'	23	SAMPLED WITH 1 7/8" x 2.0' split spoon FROM 15.0' TO 17.0' WITH 140LB HAMMER.	SILTY SAND COARSE TO FINE, MOSTLY FINE. 15-25% NONPLASTIC FINES. 10-20% SUB ANGULAR TO SUB ROUNDED GRAVEL. BROWN, DAMP. (SM)
				37	6" ROLLER ROCK FROM 15.0' TO 20.0' AND WASHED OUT.	
16	2	1 7/8"	TO	65	102	
				70		
17			17.0'	9" REC		
18						
19						
20			20.0'	78	SAMPLED WITH 1 7/8" x 2.0' split spoon FROM 20.0' TO 22.0' WITH 140LB HAMMER.	GRAVELLY SILTY SAND COARSE TO FINE, MOSTLY FINE. 15-25% NON PLASTIC FINES. 15-25% SUB ROUNDED TO SUB ANGULAR GRAVEL. BROWN, DAMP. (SM)
21	3	1 7/8"	TO	92	6" ROLLER ROCK FROM 20.0' TO 25.0' AND WASHED OUT.	
				84	166	
22			22.0'	100		
				15" REC.		

(Test)

Boring No. FD-65-5(D)

Site: HODGES VILLAGE
OXFORD, MA

Boring No. FD-85-5 (D)

DEPTH (ft.)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
33						
34						
35			35.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 35.0' TO 37.0' WITH 140 LB. HAMMER.	SILTY GRAVELLY SAND COARSE TO FINE, MOSTLY FINE 25-35% SUB ROUNDED TO SUB ANGULAR GRAVEL, 15-25% NON PLASTIC FINES, BROWN, DAMP. (SM)
				90		
				65	6" ROLLER ROCK FROM 35.0' TO 37.0' AND WASHED OUT.	
36	4	1 7/8"	TO	84	159	
				99		
37			37.0'	10" REC		
38						
39						
30			30.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 30.0' TO 32.0' WITH 140 LB HAMMER.	
				64		

Site HODGES VILLAGE
OXFORD, MA.

Boring No. FD-55-5 (D)

DEPTH (ft)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
31	5	1 7/8"	TO	63	6" ROLLER ROCK FROM 30.0' TO 38.0' AND WASHED OUT.	GRAVELLY SILTY SAND
				60	123	COARSE TO FINE MOSTLY FINE 15-25% NON PLASTIC FINES. 15-20% SUB ROUNDED TO SUB ANGULAR GRAVEL. BROWN, DAMP. (SM)
32			35.0'	90 / 13" REC.		
33						
34						
35			35.0'		100+ SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 35.0' TO 35.5' WITH 140LB HAMMER.	GRAVELLY SILTY SAND
	6	1 7/8"	TO	100+ / 6" REC.	* REFUSAL ENCOUNTERED AT 35.5'	SAME AS SAMPLE #5 (SM)
			35.5'			
36					6" ROLLER ROCK FROM 35.0' TO 40.0' AND WASHED OUT.	
37						
38						
39						

(Test)

Boring No. FD-55-5(D)

Site: HODGES VILLAGE
OXFORD, MA.

Boring No. FD-BS-5 (D)

DEPTH (Ft.)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
40			40.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 40.0' TO 41.0' WITH 140 LB HAMMER.	SILTY GRAVELLY SAND COARSE TO FINE, MOSTLY FINE. 15-25% SUBROUNDED TO SUB ANGULAR GRAVEL 10-20% NON PLASTIC FINES. BROWN, DAMP (SP1-SM)
	7	1 7/8"	TO	93	*REFUSAL ENCOUNTERED AT 41.0'.	
				100+	6" ROLLER ROCK FROM 40.0' TO	
41			41.0'	9" REC	45.0' AND WASHED OUT.	
					193+	
42						
43						
44						
45			45.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 45.0' TO 47.0' WITH 140 LB HAMMER.	SILTY GRAVELLY SAND COARSE TO FINE, MOSTLY FINE, 20-25% ANGULAR TO SUB ROUNDED GRAVEL. 15-25% NON PLASTIC FINES. BROWN, DAMP. (SM)
				44		
				75	6" ROLLER ROCK FROM 45.0' TO 50.0' AND WASHED OUT.	
46	8	1 7/8"	TO			
				87	162	
				72		
47			47.0'	8" REC		

Site: HODGES VILLAGE OXFORD, MA.

Boring No. FD-85-5 (D)

DEPTH (ft)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
48						
49						
50			50.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 50.0' TO 52.0' WITH 140 LB. HAMMER.	SILTY GRAVELLY SAND COARSE TO FINE, MOSTLY FINE. 25-30% ANGULAR TO SUB ROUNDED GRAVEL. 15-25% NON PLASTIC FINES, BROWN, DAMP (SM)
				39		
					6" ROLLER BIT FROM 50.0' TO 55.0' AND WASHED OUT.	
51	9	1 7/8"	TO	51		
					117	
				66		
				67		
52			52.0'	16" REC.		
53						
54						
55			55.0'		160+	
	10	1 7/8"	TO 55.25	160+		NO RECOVERY.
				0" REC	END OF OVERBURDEN SAMPLING OPERATION 55.25'	BOTTOM OF BORING 55.25'
56						

(Test)

Boring No. FD-85-5(D)

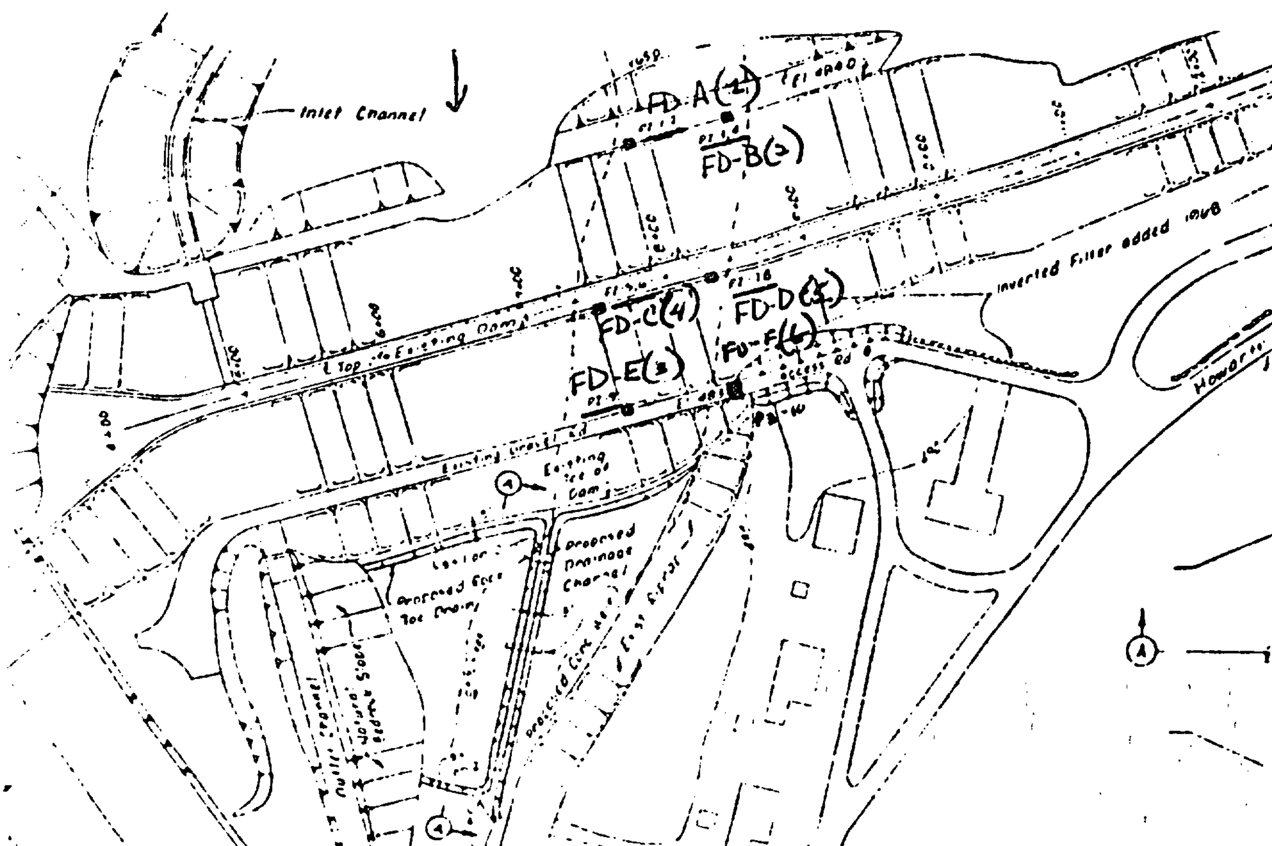
Site: HODGES VILLAGE OXFORD, MA.
Boring No: FD-65-5(D)

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
[illegible]/4/55	10:00AM	10.0'	55.25'	46.5'	472.5'	

Note: Depths are in feet below original ground.

BORING LOCATION SKETCH



PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MA. | DATE. 6/4/85

LOCATION (STA): FD-85-5(D) | OFFSET FROM CENTER LINE: 1.0' EAST OFFSET | PIEZ NO.: PZ-8

PIEZ TYPE: CASAGRANDE | DEPTH OF PIEZ: -28.0' | RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): SILTY GRAVELLY SAND | SOIL SAMPLE NO.: 4 | BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 4" x 5.0' THREADED STEEL PIPING | VENT: THREADED STEEL CAP

GROUND ELEV.: 519.0' ± | ELEV. TOP OF RISER: 519.0' ± | ELEV PIEZ TIP: 491.0'

FILTER: #1 BLAST SAND | FROM ELEV: ~~479.0~~ 478.5 4/4/95 see [illegible] | TO ELEV: 500.0'

SEAL: BENTONITE | FROM ELEV: 500.0' | TO ELEV: 505.0'

INSTALLED BY: MOBILE DISTRICT | CONTRACT NO.: | FOREMAN: Raymond BROWN

DATE OF INSTALLATION: 6/4/85 | DATE OF OBSERVATIONS: 6/4/85

METHOD OF TESTING PIEZ.:

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
12:15	1	.8'						
12:20	5	1.0'						
12:25	10	1.0'						
12:30	15	1.5'						
12:45	30	2.9'						

REMARKS: PIEZOMETER DEPTH ALTERED TO ELEVATION 491.0' DUE TO FALL IN OF FD-85-5(D)

Mark A. Owens
INSPECTOR

PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MS. DATE: 6/4/65

LOCATION (STA): FD-65-5(D) OFFSET FROM CENTER LINE: 1.0' EAST OFFSET PIEZ NO.: PZ-8

PIEZ TYPE: CASAGRANDE DEPTH OF PIEZ: -52.5' RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN (SOIL TYPE): SILTY GRAVELLY SAND SOIL SAMPLE NO.: 10 BORING DIAM: 6"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 4" ϕD X 5.0' THREADED STEEL PIPING VENT: THREADED STEEL CAP

GROUND ELEV.: 519.0'± ELEV. TOP OF RISER: 519.0'± ELEV PIEZ TIP: 466.5'±

FILTER: #1 BLAST SAND FROM ELEV: 463.75' TO ELEV: 473.5'

SEAL: BENTONITE FROM ELEV: 473.5' TO ELEV: 478.5'

INSTALLED BY: MOBILE DISTRICT CONTRACT NO.: 60 FOREMAN: Raymond Brown

DATE OF INSTALLATION: 6/4/65 DATE OF OBSERVATIONS: 6/4/65

METHOD OF TESTING PIEZ.:

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
12:16	1	1.0'						
12:21	5	1.0'						
12:26	10	1.0'						
12:31	15	1.25'						
12:46	30	2.8'						

REMARKS:

Mark A. Owens
INSPECTOR

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. 0027

Site HODGES VILLAGE — Page 1 of 8 Pages

Hole No. FV-85-6(F) Diam. (Casing) 6" + 4" — Boring Started 6/5/85

Co-ordinates: N _____ E _____ — Boring Completed 6/11/85

Drilled by MOBILE DISTRICT — Report Submitted _____

Purpose of Exploration PIEZOMETER INSTALLATIONS TO DETERMINE THE PHREATIC SURFACE, PORE PRESSURES AND PERMEABILITIES

Elevation Top of Hole 484.0'± M.S.L. — Casing Left in Place 20.0' Feet

Total Overburden Drilled 36.0' Feet

Elevation Top of Rock — M.S.L.

Elevation Bottom of Hole 448.0'± M.S.L.

Total Rock Drilled — Feet

Total Depth of Hole 36.0' Feet

Core Recovered — %

Core Recovered _____ Ft.; _____ Diam. _____ In.

Soil Samples 17/8" In. Diam. 6 No.

Soil Samples _____ In. Diam. _____ No. — Water Table Depth 14.0'±

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0'	5.0'	10" ROLLER ROCK
5.0	5.0'	DRILLED 6" CASING
0.0'	20.0'	DRILLED 4" CASING (LEFT IN HOLE)
3.0'	36.0'	6" ROLLER ROCK AND WASHED OUT
5.0'	36.0'	SAMPLED WITH 1 7/8" X 2.0' SPLIT SPOON IN 5.0' INTERVALS

Items

Ground Water _____ Back of Page 7

Boring Location Sketch _____ Back of Page 7

Overburden Record _____ Page 1-6

Rock Drilling _____ Page —

PIEZOMETER INSTALLATION Page 8

_____ Page _____

_____ Page _____

Prepared by Mark A. Owens
Field Data — Lab. Data

Submitted by Mark A. Owens

NED FORM DEC 63 121

REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site HODGES VILLAGE OXFORD, MA Page 2 of 8 Pages

Boring No. FD-PS-6 Desig. PZ-6 F Diam. (Casing) 6"

Co-ordinates. N _____ E _____

Elevation Top of Boring 494.0' ± M.S.L.
Total Overburden Drilled 36.0' ± Feet
Elevation Top of Rock – M.S.L.
Total Rock Drilled – Feet
Elevation Bottom of Boring 448.0' ± M.S.L.
Total Depth of Boring 36.0' Feet
Core Recovered ____ % No. Boxes ____
Core Recovered ____ Ft : ____ Diam. ____ In.
Soil Samples 1 7/8" In. Diam. 6 No.
Soil Samples ____ In. Diam. ____ No.

Hammer Wt. 140 lbs. Boring Started 6/5/85
Hammer Drop 30"
Casing Left 20.0' Boring Completed 6/11/85
Subsurface Water Data ____ Page 7
Obs. Well ____
Drilled By MOBILE DISTRICT
Mfg. Des. Drill ____
Inspected By: Mark A. Owens
Classification By: Mark A. Owens
Classification By: ____

DEPTH	CORE/SAMPLE			BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1"=	NO.	SIZE	DEPTH RANGE	CORE REC'VY		
					10" ROLLER ROCK FROM 0.0' TO 3.0'. DRILLED 6" CASING FROM 3.0' - 5.0'. 6" ROLLER ROCK FROM 5.0'-20.0' AND WASHED OUT.	

GENERAL REMARKS: EXTENT OF ROCK FILL IS DEEPER THAN ANTICIPATED.
WATER LOST AT 23.0'

Site: HODGES VILLAGE, OXFORD, MA.

Boring No. FD-85-6 (F)

DEPTH (ft)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
5	1	1 7/8"	5.0' TO 6.0'	47 / 100+	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 5.0 - 6.0' WITH 140 LB HAMMER. 4" ROLLER ROCK FROM 5.0' TO 10.0' AND WASHED OUT. DRILLED 4" CASING FROM 5.0' TO 10.0'. 147+	SILTY SANDY GRAVEL ANGULAR TO SUB ROUNDED 10-20% MED. TO FINE SAND 10-15% NON PLASTIC FINES GRAY-BROWN, MOIST [ROCK FILL] (GP-GM)
6			6.0'			
7						
8						
9						
10	2	1 7/8"	10.0' TO 10.6'	100+	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 10.6 - 10.6' WITH 140 LB HAMMER. 4" ROLLER ROCK FROM 10.6' TO 15.0' AND WASHED OUT. 100+	SILTY SANDY GRAVEL SAME AS SAMPLE #1 [ROCK FILL] (GP-GM)
11			10.6'			
12					*NOTE - REPEATED REFUSALS IN ROCK FILL ZONE.	
13						

(Test)

Boring No. FD-85-6(F)

Site: HODGES VILLAGE, OXFORD, MA.

Boring No. FD-85-6 (F)

Page 4 of 8

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
14						
15			16.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 15.0' TO 17.0' WITH 140 LB HAMMER	SILTY GRAVELLY SAND COARSE TO FINE 10-15% ANGULAR GRAVEL 5-10% NON PLASTIC FINES. ABUNDANT ROCK FRAGS. GRAY, MOIST. (SW-SM)
				31		
				40	4" ROLLER ROCK FROM 15.0' TO 20.0' AND WASHED OUT.	
16	3	1 7/8"	TO		DRILLED 4" CASING FROM 10.0' TO 20.0'	
				38	DROVE 4" CASING FROM 16.0' TO 20.0' WITH 140lb. HAMMER.	
				53		
17			17.0'	18" Rec.	18	
18						
236						
19						
175						
20			20.0'		SAMPLED WITH 1 7/16" x 2.0' SPLIT SPOON FROM 20.0' TO 22.0' WITH 140 LB HAMMER.	SILTY SAND COARSE TO FINE, MOSTLY FINE 20-30% NON PLASTIC FINES <10% ANGULAR GRAVEL VERY ABUNDANT WEATHERED ROCK FRAGMENTS GRAY-BROWN, MOIST (SM)
				41		
				36	4" ROLLER ROCK FROM 20.0' TO 25.0' AND WASHED OUT. (DOWN PRESSURE 300LBS)	
21			TO			
				47		
					83	
22			22.0'	57		
				11" Rec.		

(Test)

Boring No. FD-85-6(F)

Site: HODGES VILLAGE, OXFORD, MA.

Boring No. FD-FS-6 (F)

DEPTH (ft)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
23						
24						
25			25.0'		SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 25.0 - 26.0' WITH 140 LB HAMMER.	NO SAMPLE RECOVERED
	5	1 7/8"	TO	57		
				100+	4" ROLLER BOOR FROM 25.0' TO 30.0'.	
26			26.0'	0" rec.	(DOWN PRESSURE INCREASED TO 450 LBS)	
				159+		
27						
28						
29						
				100+		
30			30.0' TO 30.25'	100+	SAMPLED WITH 1 7/8" x 2.0' SPLIT SPOON FROM 30.0' TO 30.25' WITH 140 LB HAMMER.	SILTY SAND COARSE TO FINE MOSTLY FINE, 20-25% NON PLASTIC FINES. DARK GRAY, MOIST (SM)
	5	1 7/8"				

(Test)

Site: HODGES VILLAGE OXFORD, MA.	Boring No. FD-85-6 (F)	Page 6 of 8

DEPTH (ft)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
					6" Rolled Rock From 30.0' to 35.0' and washed out.	
31						
32						
33						
34						
35	6	1 7/8"	35.0' to 36.0'	90 / 100"	Sampled with 1 7/8" x 2.0' split spoon from 35.0' to 36.0' with 140 lb Hammer. 190+	No sample recovered
36			36.0'	0" Rec.	Termination of sampling procedures	Bottom of Boring 36.0'

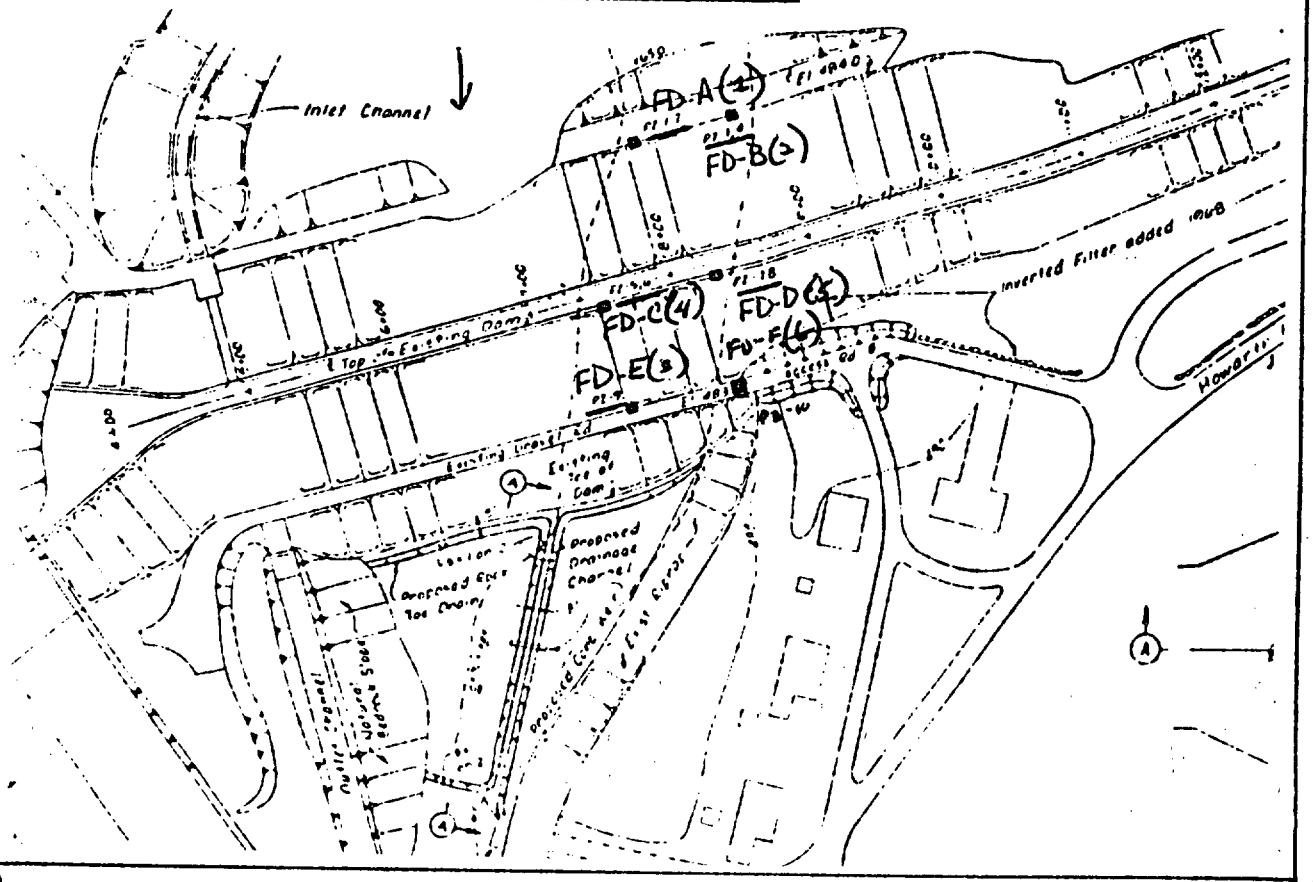
Site: HODGES VILLAGE OXFORD, MA.
Boring No: FD-85-6 (F)

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
6/10/85	12:45pm	20.0'	25.0'	13.75'	470.25'	
6/11/85	1:30pm	20.0'	36.0'	14.10'	469.	

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



Boring No. FD-85-6 (F)

PIEZOMETER INSTALLATION REPORT

PROJECT: HODGES VILLAGE OXFORD, MA. DATE: 6/11/85

LOCATION (STA): FD-85-6(F) OFFSET FROM CENTER LINE: PIEZ NO.: PZ-10

PIEZ TYPE: CASAGRANDE DEPTH OF PIEZ: -33.0' ± RISER PIPE DIAM: 3/4"

PIEZ TIP SET IN SOIL (SOIL TYPE): SILTY SAND SOIL SAMPLE NO.: 5+6 BORING DIAM: 6" + 4"

METHOD OF INSTALLATION:

TYPE OF PROTECTION FOR PIEZ: 2.0' CAST IRON PIPE VENT: GATE BOX COVERING

GROUND ELEV.: 484.0' ± ELEV. TOP OF RISER: 484.0' ± ELEV PIEZ TIP: 451.0' ±

FILTER: #1 BLAST SAND FROM ELEV: ~~451.0' ±~~ BOH 448' TO ELEV: 461.0' ±

SEAL: BENTONITE FROM ELEV: 461.0' ± TO ELEV: 466.0' ±

INSTALLED BY: MOBILE DISTRICT CONTRACT NO.: FOREMAN: Raymond BROWN

DATE OF INSTALLATION: 6/11/85 DATE OF OBSERVATIONS: 6/11/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1:30	1	13.5'						
1:35	5	14.1						
1:40	10	14.1						
1:45	15	14.1						
2:00	30	14.1						

REMARKS:

Mark A. Owens
INSPECTOR